The Builder.

VOL. XLVI No. 2137 SATURDAY, JANUARY 19, 1884.

ILLUSTRATIONS.

Church of All Saints, Hull.—Design for the Proposed "Walsham Memorial" Tower, by Mr. S. Musgrave, Architect 97
Nottingham Municipal Buildings (Double-page Photo-Lithograph).—Accepted Design by Messrs. Verity & Hunt, Architects 98
The Rathhaus, Markt-Breit, Bavaria (Double-page Photo-Lithograph) 100, 101
Plans of the Nottingham Municipal Buildings 98, 105
New Premises in Uxbridge-street, Notting Hill.—Mr. Arthur Young, Architect 107

CONTENTS.

Murray's "History of Greek Sculpture" 83
The Laws concerning Public Health 85
Mr. Alfred Hunt's Landscapes 85
Notes 86
Combined Land and Water Transport in India and Elsewhere, and its Relation to Industrial Prosperity 87
Honours to Architects 89
The Circular of the Town Clerk of the City of London as to the Corporation Water Bill 90
The Old Chancery Courts, Lincoln's Inn 90
Foreign Notes 90
On the Science of Mechanics as applied to the Fine Arts 91
The Walsham Memorial Tower, All Saints' Church, Margaret-street, Hull 92
Professor Newton's Lectures on Monuments of Lycian Art 92
Nottingham Municipal Buildings 109
The Rathhaus, Markt-Breit 109
New Premises, Uxbridge-street, Notting-hill 109
Fountains Abbey 109
The *Quarterly Review* on the Dwellings of the Poor 110
Northern Architectural Association 111
The Influence of Doctrine on Church Architecture 112
Mr. Whichcord's Appeal to "Organise" 112
Monument to the late General Margueritte 112
International Health Exhibition 112
The Fall of a Railway Bridge in Lancashire 113
The Conference of French Architects at Nice 113
Royal Academy: Admissions to the Architectural School 113
Sales of Building Land at the East End 113
St. Alban's Abbey 113
Building Patent Record 114
Iron and Concrete 114
"Ensilage" 114
Water Supply of the City of London 114
Mysterious Tenders 115
Salford Sewage Works 115
Competitions 115
Rendle's Patent Glazing 115
Provincial News 115
Books: Clark's Practical Geometry and Engineering Drawing 116
Meetings 116
Miscellanea 116

Murray's "History of Greek Sculpture."

IN the second and concluding volume of Mr. Murray's admirable work on Greek sculpture* we are on somewhat firmer footing in regard to the historical view and treatment of the subject. We have great names, of whom and of whose works we, at least, know something; we have a certain number of signed productions, and of others the authorship of which has been shown with a probability approaching to proof, whereas in the earlier volume the ground was, as we observed at the time, so debateable that the title might better have been put in a modified form as "A Conjectural History of Greek Sculpture." Even here, however, as Mr. Murray confesses in his preface, the charm of artistic personality, which has often given such interest to the pages of a historian, is wanting. Greek sculpture "presents no Lives" to beguile the student along an arduous path. "Only here and there an incident, handed down on mostly a dubious authority, breaks the narrative of work done and the examination of what remains of it to our day." There is this great added interest, however, as we get later in the progress of Greek art, that we find ourselves face to face with works of the highest order in themselves, not with archaic and partially tentative effects. Thus, if the historical interest is doubtful and sometimes illusory, the artistic interest of the portion of the subject treated in the volume before us is paramount, and, it may be said, undying. It commences with the Parthenon sculptures, includes those of the Erechtheion and the Temple of Victory, and the names of Praxiteles and Scopas, and concludes with a brief glance at the school of imitative Greek sculpture of the Roman period; the author declining, however, to follow out this part of his history to the decay of the art, as needlessly prolonging the study of a phase of the subject which can only be unsatisfactory and somewhat melancholy.

To an author inviting us to look once more in a critical spirit at those masterpieces of sculpture the representations or reproductions of which have filled the civilised world, and have become almost as familiar to our eyes as the moving forms of modern life, we are naturally disposed to turn with the question, what new light has he thrown on these works, their style, their meaning, the nature of their artistic powers, which can be valuable to us as suggesting the road to a better and more complete comprehension of them. Mr. Murray suggests at the outset a re-consideration of a question which has been very differently viewed in reference to Greek sculpture; the element of idealism in it. We do not think the author very clear in the expression of his meaning; but it must be remembered that it is a subject in which verbal definition is very difficult, even to some extent impossible. Mr. Murray puts it that a painter sketching a landscape before him has presumably been struck and captivated by some beauty in it, but that he could not have been so captivated unless the landscape had answered to an ideal possibility before shadowed forth in his own mind. The real landscape assists him to frame his ideal in a less vague form, but he does not treat it realistically in copying it; to do that would be to make it co-equal with the image or idea which it is meant to serve and assist. This is a very heretical view in reference to a great deal of the artistic practice and criticism of the present day, but the latter part of the remark is a very good way of putting the relation of nature to art. We may somewhat question the position that the artist must have a vague ideal of that special landscape in his own mind to have derived pleasure from it; we should rather say that he must have the idea of certain qualities of landscape, derived from observation, no doubt, or he would not understand the special landscape. But the observation that the too realistic reproduction of what he sees with the outer eye is a defeating of what would otherwise be the true value of the landscape in furnishing food for ideal art, is very true and very well put, though very likely "Greek" to general readers. The application of this to sculpture is obvious enough. The artist of an early period has in his mind an ideal figure of a man, of a certain ideal character, which yet he could never have had but for the prompting of the appearance and character of the real men around him; he uses the imitation of them as the help towards embodying his ideal. But the mechanical difficulties of adequate imitation beset him very hard, and lead to many efforts towards an idealisation of skill and execution, and the results of these enter into the minds of later artists as ideal factors, instead of simple nature herself. Thus we have the foundation of a school in which a certain method of treatment is adopted, not derived directly from nature; or we have, before the art has reached its highest stage (or even after that), a special ideal accepted and repeated, with continual reference to nature for verification and correction. In this way, observes the author, a comparison of the early Greek vases will show with what constancy the main elements of composition were adhered to and repeated, "as if they were artistic formulæ established for all time."

Thus the idealisation of skill plays an important part in Greek art, which is simple in its originating motives, though highly refined in execution, and this executive influence operated through the character of the material also. A great deal of the Greek idealisation of human form, it is suggested, may have arisen, not so much from any deep-seated theory as to what the form and character of anthropomorphic deities ought to be, as from the semi-practical result of working so much in bronze and marble. This we believe to be quite true; and this conventionalised marble style of the Greeks has influenced sculpture down to our own day. Recently a rebellion has been made against it by a good many sculptors in France and Italy; but the results have tended to prove that for such a material as marble the Greek style was the right one,—we might even say, the natural one. The real successes in sculpture of a more naturalistic and detailed character, such as those of Dalou and some other French sculptors, have been achieved in terra-cotta; a fact in itself bearing out the view as to the influence of material upon the form taken by the art.

Thus we may take it that the gods and goddesses, greater and lesser, of the Parthenon tympana were not the result of a conscious endeavour to idealise human forms into what might be considered adequate representations of deities. They were representations of deities in the guise of the noblest and most healthful human forms, conventionalised into a broad and monumental style, in which some of the minor realistic details of the living human figure were merged in a broader and more massive,—as we should now say, more sculpturesque,—treatment, arising mainly out of the conditions imposed by the material, and partly also from the situation in which the work was to be placed, rather far from the eye and in close connexion with the severe lines of Greek architecture. That there was no intention of avoiding realism, except so far as the condition of place and material rendered it desirable or natural to do so, may be in-

* A History of Greek Sculpture under Pheidias and his Successors. By A. S. Murray, of the Department of Greek and Roman Antiquities, British Museum, Vol. II. With Illustrations. London: John Murray. 1883.

ferred from that one little fact of the creasing of the skin of the armpit of the Neptune fragment, which delighted Haydon so much.

These figures, then, appear to have been intended by Pheidias* and his colleagues as the noblest representations of the human figure which they could produce in architectural sculpture, although nominally accepted as representing (probably very inadequately in the idea of Pheidias) superhuman beings. The popular idea that there is a very imaginative and ideal aim in the sculptures of the Periclean period we have long believed to be a misapprehension. There is, in fact, in Greek art an exceedingly practical element, not forced forward too much, but never out of sight. The desire to create ideals of gods and goddesses, if it floated through the mind of the artist, was subordinate to the more practical idea of making a fine series of figures, and planting them effectively in their architectural framework. The now incontrovertible fact, which so long shocked the minds of students of Greek art, that Pheidias made his great works in ivory and gold finishing, is almost conclusive against the notion that the Greeks were especially possessed of idealising aims in their statues. Monumental expressiveness in the external sculpture, rich decorative effect in the internal, were their most direct aims. There was nothing whatever in the Greek artistic mind analogous to that deep thoughtfulness which underlies the mere outward delineation in the works of Michelangelo and, when at his highest, of Raffaelle.

To go more into detail; the most interesting portion of Mr. Murray's remarks on the Parthenon sculpture is in reference to the frieze. This has for some time past been regarded by most men who "can render a reason" as being probably a representation, very nearly realistic, of the actual procession of the Panathenaic festival, merely conventionalised so far as the conditions of architectural sculpture demanded. Mr. Murray thinks that it was not a representation of an actual fact of the day so much as a repetition of a more archaic treatment of the same subject which had decorated the previous temple, the Hecatompedos. The reasons for this opinion, which are of some interest, are thus given:—

"By assuming the various elements of the procession on the Parthenon frieze to have been enlarged and enriched from the older temple to suit the greatly increased dimensions, there is this to be gained, that its infinite variety and splendour of movement, which now seems overpowering and out of comparison with the reality of an ordinary festal procession, may be explained as the result of a wealth of artistic invention lavished on a subject which had become familiar on the Acropolis as a sculptured representation. Otherwise it must be judged as an idealisation from a common reality, and that this is no easy task, the innumerable efforts to interpret it abundantly prove. In the age of Pericles the Panathenaic procession was, doubtless, an occasion of public pride and agitation. Yet it seems to us now impossible to imagine that, with every allowance of this kind, it could then have been made to form, for the first time, the basis of so elaborate a conception. To Peisistratos, on the other hand, belonged the glory of establishing the greater Panathenaic games, and for his immediate descendants to have perpetuated this event by representing it on the temple of Athene was natural enough. That temple, to all appearance, owed its existence to them. The Panathenaic procession, treated with the simplicity of the archaic bas-relief of which we have been speaking, and extending along the comparatively small dimensions of the Hecatompedos, would be clear and intelligible as a single idealisation of a well-known scene in Athens. On the Parthenon frieze it is still an idealisation of that scene; but the artist has united in it an ideal drawn from actual observation along with an ideal founded either on a previous rendering of the subject, or on previous renderings of similar subjects. Of these alternatives the former appears to be the more consistent with the circumstances of the case. It illustrates the force of artistic tradition, and it explains the power of public sentiment in retaining on the principal temple a scene which, from its nature, belonged to the representations of an age of art which had passed away. Its creation in the time of Pericles is incomprehensible. Its splendid elaboration then, from the sample product of an earlier period, conforms to what is known of the sculpture of that time; and that this single product had existed on the older temple which the Parthenon was built to replace is, at all events, a strong probability."

This is the only reasonable reason we have seen given for what must strike every thoughtful student of the Parthenon marbles, viz., the great *naïveté* of character and feeling in the frieze, as compared with the rest of the work, the pediment sculpture and the best of the metopes. They by no means give the impression of belonging to the same age and the same building. Mr. Murray, we observe, does not regard it as proven that the frieze represents the Panathenaic procession, but accepts it as the most probable theory. Into the meaning and composition of the frieze he has gone with great care, and this is one of the most interesting portions of the book. He regards the north and south friezes as representations of the same procession, as if seen from two sides of the street. As he says, the observer, a Greek of the time of Pericles, familiar with works of archaic art, in which desire to have both sides of a thing represented had led to fixed conventionalisms in composition, would have found no difficulty in annihilating in imagination the whole breadth of the Parthenon, which separated these two friezes, and combining them in his mind after seeing both separately. The west frieze is occupied with the starting of the procession, though Mr. Murray admits the body does not file away evenly north and south, but that the large majority of the horsemen move off to the north side. Into the details of explanation we cannot go here; but the two sides of the procession, he considers, progress eastward along the two flanks, and at the east end is the circle of seated deities, who are the objects of the procession. The suggested explanation of the seated group, who are sideways and back to back, the seated figure on the throne in the centre being also seen sideways (so that there is no real centre of the group), is certainly very ingenious and worth consideration. It is that the gods are really intended to have been seated in a semicircle, facing the head of the procession as it approaches; but that the group is on what might be called a sort of "Mercator's projection," drawn out in the flat, and shown in profile, for more convenient representation in low relief, and perhaps to fill the space of the frieze better. Mr. Murray gives a perspective representation of the arrangement which the frieze, he considers, was meant conventionally to convey to the eye. In all this there is a good deal that is very probable; and we may add that there is a historic interest in this view which the author does not touch upon. If the frieze were, as he suggests, a repetition in more elaborate form of an archaic frieze representing the same subject, this representation in profile of what is not intended to be thought of as in profile, may have been a remnant of the archaic treatment of the older frieze, preserved for the sake of association; and it reminds one curiously, too, of the connexion of Greek with Egyptian art, and of the profile figures of the Egyptians. Whether the seated figures referred to are deities is another question. Mr. Murray says it is the generally accepted opinion that they are. On their own merits they do not give us that idea, and one of Mr. Murray's reasons for it, that, though seated, their heads are on a level with those of the persons standing, goes for little or nothing, because throughout the whole frieze a conventional adaptation of heights is kept up in this way, the riders' heads coming little above the heads of the pedestrians; the whole arrangement being obviously made to harmonise the main line of the sculptural composition with the horizontal lines of the building.

The metope sculptures are the object of some interesting criticisms; it is pointed out that they show a different proportion of limbs from the frieze figures, and Mr. Murray thinks "a manifest desire to elevate the subject, and render it worthy of the building." This may be said of two or three of the metopes, the merit of which we have always thought very unequal, and we quite agree in the idea that they are not all the work of the same artist, though we do not know if we should accept necessarily Mr. Murray's distinction between those in which the forms of man and centaur are blankly opposed, and those in which drapery is introduced to connect them.

The interest of the Parthenon sculptures and the suggestions concerning them has occupied us too long to do more than glance at one or two other points in Mr. Murray's work. The progress of Greek sculpture style, from the grand monumental manner of Pheidias, through the more delicate and somewhat more realistic yet refined manners of Praxiteles, to the comparatively course and prosaic Græco-Roman manner, is well brought out in the further chapters, from those on the Parthenon up to the close. The graceful statue of Apollo Sauroktonos might be, as Mr. Murray observes, a *genre* work rather than a representation of an ideal figure. The so-called "Fighting Gladiator," which is now said to be a running figure, though we should never call the action of the feet "running," exhibits the vulgarity of mere successful representation of an athletic man of no very high type; probably, however, no work of antique art has been more drawn, sketched, and reproduced in all kinds of ways; it is a favourite student's exercise, probably on account of the various practice in foreshortening which, from the attitude, the limbs afford in various points of view. Rayet assigns the work to date B.C. 170 at the earliest. Mr. Murray observes, "like the Laocoön, it is on the one hand a display of muscular form under the severest tension, and on the other an example of creative force originating in technical knowledge of muscular form, and only extending beyond this knowledge to the smal degrees of some slight observation of Nature herself. The type of head is derived from Lysippos. At a greater distance this is true also of the whole form, and yet it is manifest that there is something in the statue that constitutes a break with the older traditions of Greek sculpture, and allies it rather with the later Græco-Roman movement. The Laocoön produces the same impression. In both the idea is carried out with complete technical skill, and with singular force. But it is an idea generated out of this skill, to which indeed it is a slave." We can hardly agree in placing the Laocoön no higher than this; it is at all events a work much superior in expression and feeling to the "Runner"; dealing also with a more elaborate task in technique.

The volume is very fully and well illustrated, sufficiently so to bring out afresh to our conviction the unimpeachable superiority of the Pheidian sculpture to all work, even Greek, which preceded or followed it. In the tympanum sculptures of the Parthenon, which are, of course, the "roof and crown of things" in sculpture, this superiority, rather perhaps to be felt than defined, is so marked as to render almost everything else amongst the illustrations comparatively commonplace by the side of them. If we were to try to define in what this superiority consists, it would seem to be summed up in the precise balance of all the qualities of which sculptural design is capable; truth to all the leading facts and characteristics of nature, without vulgar realism; nobility of form and repose of expression and grouping, not degenerating into stiffness or conventionalism; brilliant and effective treatment of drapery, without obscuring the build of the figure; indeed, helping to express it. This complete observance of balance, and the instinctive recognition of the capabilities of the material, and of the degree to which detail should be worked out in relation to the architectural portion of the structure, result in productions which represent the perfection of style, which almost means the same thing as balance. Words, however, at best fail to express what one feels as to the commanding quality of these greatest works of the art of the Greek sculptor, which

* Mr. Murray's pages do not tend to decrease the confusion as to English writing of Greek names. The spelling "Pheidias" is, however, now becoming so much adopted by literary men and artists that it seems undesirable further to stand out against it, as the long-accepted habit of representing the "ei" in the first syllable and the "i" in the second by the same English letter was certainly not defensible to begin with. But we see no reason for writing, as Mr. Murray does, "skopas" and "Perikles," *c* being the admitted correlative of the Greek *k*. And, if Mr. Murray is so particular on that point, why does he write "Erectheum"? If we write "Parthenon," certainly in common-sense we should also write "Erechtheion."

called into play, in our author's concluding words, "many of the best qualities with which men are endowed," so much so, that in the Parthenon marbles we seem to feel almost a moral as well as an artistic greatness; something in the presence of which all littlenesses and tricks, either of art or manner, seem rebuked as by a superior influence.

THE LAWS CONCERNING PUBLIC HEALTH.

THE obscurity which hangs over much of the early history of our country is due to the paucity of contemporary records, to the astounding credulity of the annalists, and their habit of receiving the materials of their accounts at second-hand and from prejudiced sources without question. As a consequence we are compelled to get at an approximation to the truth of events which happened long ago as best we may, by analogy, by inference, and in a measure by conjecture.

It would appear as probable that our posterity will be similarly perplexed from an entirely opposite cause, and that the very abundance of their available information concerning us will prevent their arriving at any clear conclusion as to our condition and our doings.

The [Macaulay of the future who shall endeavour to realise the circumstances surrounding the lives of the bulk of the people in the latter years of the reign of Queen Victoria will take down from the shelves of the British Museum amongst other volumes the one now lying before us,* a handsome quarto of 800 pages, comprising a mass of legislation, having for its object the social and physical well-being of the community. Some idea of its scope and comprehensiveness may be formed from the fact that the mere enumeration of the Acts of Parliament bearing upon the public health, passed within the last few years, and their leading clauses, extend to forty-eight closely-printed pages.

From a perusal of the contents of the book he will find that careful provision has been made for the health of man, woman, and child, under every conceivable condition of life.

The preservation of infant life, his defence against improper nursing, against preventible disease, his education, the regulation of his hours of labour, and the apportionment of the quality and quantity of that labour to his age and capabilities, are all prescribed. In mature life, the citizen is the subject of equal care, and is guarded so far as practicable against harm from his own acts as well as from those of his fellow-men. He is provided with healthy dwellings, properly built, drained, and ventilated. Pure water is furnished for his drink, and he is secured against unwholesome food, in almost all forms by an elaborate series of legislative precautions. Noxious and offensive occupations are removed to a safe distance from his dwelling. Public hospitals and special sanitary arrangements in times of epidemic offer the poorest in the land such skilful treatment, as can only be otherwise commanded by the very rich. The close of an unsuccessful struggle with the world is rendered less bitter by the organised charity of the State, and at his death the last offices are conducted decently and reverently at the public charge. Everything that the most anxious care and the employment of the highest skill can attain for the amelioration of human life is done, and the Acts which embody the noble endeavour will remain to all future a monument of the humanity of the age, and a triumph of Christian as compared with the older Pagan ethics. Our imaginary inquirer would conclude, and he would be justified in concluding, that in the year of grace 1883 the English nation were well housed, well fed, well educated, healthy, and happy; that their cities were models of sanitary perfection; that abject poverty and avoidable sickness were, if not altogether banished from our midst, at any rate an exception and an anomaly.

* The Laws concerning Public Health. By William Robt. Smith, M.D., assisted by Henry Smith, M.B. Sampson Low & Co. London. 1883.

And then, in the prosecution of his researches, he would come upon a file of old newspapers, bearing even date with the volume from which he had extracted this comfortable assurance, and he would read with dismay the revelations of those philanthropists who make it their business to trace the very poor to their squalid hiding-places, the noisome recesses of the miscalled "homes" of "Horrible London." We can partly realise the shock such a discovery would produce. He would read of a condition of things the precise opposite of the picture which had arisen in his mind on a perusal of the book adverted to. Of wholesale destruction of infant life, of education systematically neglected and the means provided for it evaded, of brutal ignorance and crime in place of the light of Christian knowledge, of poisonous exhalations surrounding the dwelling in place of pure air, of diluted sewage for drink instead of pure water, of filthy dens in place of wholesome houses, and in all things, the evils of which the mitigation or removal was pre-supposed by the Acts of the governing powers. Such a surprised reader would scarcely believe his own eyes. He would discredit the record until he found it corroborated by contemporary witnesses, and deducting, as we have been obliged to deduct, something for the involuntary exaggeration of a zealot, and something for the exigencies of a style which is addressed rather to the feelings of the public than to their judgment, he would be obliged, as we have been obliged, to conclude that in spite of all that had been done, and the greater things which had been attempted on behalf of the public in general, and the poor in particular, the picture presented and borne out by incontestable facts is indeed a sickening one. If the historian of our age carried his inquiry into the cause of this contrast between the aims of the Legislature and the facts of our time he would find that the weak point was in the provision of inadequate machinery for carrying out the regulations enjoined by Parliament. The author of the book before us abstains from any criticism of the Acts in question, reserving a discussion of their wisdom and practical efficacy to a future occasion. It is, no doubt, true that here and there they are defective, and here and there inconsistent. But we are not inclined to dwell upon shortcomings inseparable from all human work. The intention is everywhere admirable, and, for the most part, it cannot be denied but that the Acts have been framed upon the best advice and with competent skill. There are a few slips, and there are provisions of doubtful prudence, and there are gaps in the scheme to be filled up by subsequent enactments. But the main want is the provision of a more efficacious executive. The first requisite to this end is the education and appointment of an increased number of competent inspectors and surveyors, and this can only be accomplished by the inducement of proper emoluments. Certainly one of the most important of all the functionaries charged with the execution of the Public Health Acts is the inspector of nuisances, and the generally inadequate nature of his remuneration amounts to a positive injustice. The surveyors who are charged with the supervision of new works and buildings are often overworked if they are not always under-paid, and their hands are always more or less tied. And the natural result follows. It is forbidden to build upon a foundation of decaying vegetable refuse, and dwelling-houses are so founded every day. It is enjoined that all new houses shall be built with sound and suitable materials, and mortar composed of lime and clean sharp sand; and they are, as a fact, built of bad, soft materials and garden mould. A by-law, in one instance, prescribes that the whole site shall be covered with asphalte on 6 in. of cement concrete, and the site is commonly guiltless of either. It is quite an exception if an ordinary damp-course is provided. It is obvious that the machinery for putting in force the existing enactments is unequal to the occasion, and that what is required is not a further elaboration of the legislative scheme, which is sufficiently full and excellent as it stands for most practical purposes, but some reorganisation and much extension of the executive. London is not alone in this deficiency. Liverpool and Manchester, Edinburgh and Glasgow, and other large towns, in varying degrees suffer from the same cause, although some approach very near perfection in their sanitary arrangements. One of the first measures which should engage the attention of the authorities should be the rearrangement of the areas for which the district and borough surveyors are responsible, and a proportionate increase of the staff, and the placing of all under one central authority. There may be questions as to the prudence of payment by fees, and the propriety of allowing such officials to conduct a private practice in addition to their public functions; but there can be no question as to the necessity of re-arranging the limits of their several districts. There are districts in the older and more settled portions of the metropolis where the fees from some casual alteration of old buildings and an occasional rebuilding scarcely defray the office expenses of the surveyor; and there are other districts where the immense activity of the speculating builder yields the surveyor a large income by crowds of buildings rising with a rapidity which defies, under the existing system, such a scrutiny as will ensure their being constructed in accordance with the regulations.

The author of the valuable collection of Acts to which we have adverted says very wisely that "compulsory sanitary legislation is never agreeable when it outruns the convictions of the public, and that their education in the principles of health is the first thing to be attended to." We are inclined to think that the public are now, for the most part, alive to the importance of the application of sanitary science to their dwellings and occupations, although amidst a multitude of professors of conflicting theories they are sometimes puzzled whom to follow. But the execution of the recommendations of the Government is now left to ignorant and careless builders, and the approval, more or less perfunctory, of surveyors not numerous enough for the work and not sufficiently rewarded for their pains to enlist their best exertions. Thanks to the various sanitary commissions and the independent labours of architects and engineers, the leading principles of sanitary science are well understood and they are fortunately of easy application. The law says they shall be observed. The only thing now wanting is a sufficient executive properly educated for its duties to enforce the law. Such a body must, sooner or later, be established, unless the mass of legislation on the subject is to become a dead letter, and its members must have at hand some such a compilation as that which the industry of the author of the book which has occasioned these remarks has supplied. We commend it to all who are interested in this important subject, and we shall welcome its promised companion volume; and, meanwhile, we may have something to say on the necessary reform of the machinery for enforcing the enactments of the Legislature.

MR. ALFRED HUNT'S LANDSCAPES.

AFTER admiring for years the examples of Mr. Hunt's genius as a landscape-painter, as they appeared from time to time in the exhibitions of the Society of Painters in Water-colours, and more rarely on the walls of the Royal Academy's rooms, it was not till last Saturday afternoon that we actually realised what a great landscape-painter he is. It needed but the first glance at the collection of oil-paintings in the larger room at the Society of Fine Arts Gallery to carry immediate conviction of what we have long believed to be the case, that work so fine and poetic as his has had no chance of being done justice to, either in regard to conception or result, on the walls of Academy exhibitions crowded with paintings in a louder and coarser key. This is the rather to be observed because some of the writers who act as "critics" have attempted to throw cold water on Mr. Hunt's oil-painting, and to assert or insinuate that in taking it up he had quitted the field of his best powers, which had been shown to the highest

advantage in water-colours. The collection of rather more than thirty paintings in oil, at present in the Gallery in Bond-street, ought to dispel this kind of nonsense once and for ever. It was difficult, except for those who would study pictures more carefully than most visitors to the Academy exhibitions do, to appreciate all the varied delicacy and truthfulness of such works as "Sonning" and "A North-country Stream," amid the glare and crowd of the annual picture show. They are works far too refined and thoughtful for such an atmosphere, though neither of them displays Mr. Hunt's highest powers. But, when placed where they can be studied quietly and without such detracting influences, their truthfulness of effect and insight into nature must be recognised without fear of contradiction from any but the groundlings. These qualities, however, beautiful as they are, become comparatively secondary when we turn to some of the works which are more distinctly poetic in conception and meaning. The "North-country Stream," which formed a gem amid last year's Academy collection, represents an every-day landscape effect in a beautiful nook of river scenery, but with no special appeal to our sense of the solemn and pathetic in the expression of the face of nature. Every square inch of canvas, certainly, is a study; we can look into the recesses of the paths under the masses of summer foliage, and imagine we could penetrate into the scene. As in the "Sonning," there is a perfectly real effect without the least hard or over-wrought realism. But there is a far deeper feeling in others of the works here, which are not less remarkable for their intensity than for their variety. It is no mere collection of landscape studies in one easily recognisable manner; the feeling, the treatment, the effect, is as diverse as in Nature herself, as it can only be when a painter is aiming at representing the feeling of Nature herself, instead of translating Nature into his own manner. This is the remarkable contrast between Mr. Hunt, who works in the spirit of Turner, and such a school of landscape as that of the eminent French painters who developed the school started by Constable. The latter are, or have been, some of them, very powerful painters, but each has his own peculiar effect, and is known by it. A Corot is a Corot, a Dupré is a Dupré; but a Hunt is a scene in nature, and the paintings in this small collection are so various in tone and feeling that it would be easy to represent it as a collection of works by various gifted landscape-painters. To take only two or three: there is the grim, barren scene "On the Coast of Yorkshire" (110), originally exhibited under the title, "An Iron-bound Coast," a desolate shore under rugged cliffs, with the wrath of surf just seen in the distance; there is the rich, golden "Whitby—Evening," a glorious sunset effect; there is "The Mountain joyous with Leaves and Streams," a bright and glittering landscape in full sunshine; there is the solemn and pathetic "Time and Tide" (how suggestive is the title), where we look, at the coming on of twilight, over a cold, leaden sea, the waste aspect of which is intensified by contrast with the strip of warm, mellow light on the wet sand reflecting the last "yellow-rifted gleam" of sunset. Each of these pictures is a distinct poem in itself, an interpretation of one of the manifold voices of nature. The last-named, it is interesting to observe, is an early one (1857), contemporary with others which are less mature in style and less intensified in feeling; it stands almost alone among the works of the same date.

Among the more numerous water-colour works we are glad to meet again many old friends, and to recognise as fully as in the oil-paintings the presence of a variety of effect derived from pure study of nature, and marred by no trick or mannerism. The prevalence of an inclination, at peculiar periods, towards one class of effect rather than another, is all that can be noted, and this only in a minority of examples. "Tynemouth Pier" (55) is the best example we have seen of Mr. Hunt as a painter of stormy sea, a subject which he has not handled very often. Near it hangs Mr. Caine's "The Rainbow" (58), a remarkable example of what may really be called the painting of light; it is seldom indeed that any painter suceeeds in making mere paper and pigments produce such an apparent dazzle to the eye as this,—the work of close study and observation, without the slightest attempt at forcing an effect by artificial contrasts.

It is in this individuality in the treatment of each scene that Mr. Hunt, among contemporary landscape-painters, stands almost, if not entirely, alone, with the exception of Mr. Albert Goodwin, who, charming as his art is, must be regarded as a painter of a lesser, slighter, and more fanciful genius. We can name no one else of whom it can be said that you cannot at once identify his works, at a little distance, by the special tone and manner which he carries with him, as his sign-manual, into everything he paints; even limiting his choice of scenes to one special character, one time of day, one particular atmospheric effect. In this respect Mr. Hunt is almost as various and truthful as Turner, though he has not the massive force and breadth of Turner. The qualities which, apart from this, seem to us most to characterise his works are a remarkable power of painting light, so to speak, and of observing and reproducing most delicate gradations of tone and colour in the various distances and lights of his scenes; a very strong feeling for the changeful and evanescent expression which makes so much of the poetry of landscape, and is sometimes wonderfully reproduced in his painting (see, for instance, "Summer Days"), so that we seem to see the lights and colours shift and glimmer on the canvas; and a faculty for giving realistic truth of effect without losing atmosphere. To this latter point, we feel sure, much study has gone in many of these works; we may instance the water-colour of "Durham" (24), where the architectural character of the bridge, the houses half-way up the hill, and the cathedral, is so truthfully conveyed without at all degenerating into mere painting of buildings; they are buildings, but they all fall into their place as part of the poetry of the whole scene. One or two early oil paintings, which have been added since the private view day, the "Haunted Stream" and "Borrowdale," are interesting, as showing Mr. Hunt before his emancipation into a style of his own. The latter is exceedingly like a Turner or a copy of a Turner, and the artist might, had he pursued this path, have been only an echo of Turner; but he has done better, and followed out the principles of Turner in his own special method.

Before concluding, there is one point in connexion with the exhibition on which we desire to make an objurgatory note; the habit, which is growing into a positive nuisance, of thrusting into a catalogue on such an occasion the disquisitions on the paintings of this or that literary commentator (we will not say "critic"). Why cannot we be allowed to enjoy the genius of A. W. Hunt without the lucubrations of E. W. Gosse? The case becomes worse when the commentator appears totally unable to appreciate the finest part of the work of the unfortunate artist upon whom he is let loose. Every person competent to feel and understand the subject knows that the remarkable point in the exhibition is the collection of Mr. Hunt's oil paintings, and that the effect of it will, probably, be to place him in quite a different position as a painter in oil from what he has been popularly supposed to hold, and to render it impossible for the Academy any longer to treat him with the disrespect they have hitherto shown to much of his work; but the catalogue passes over this section of his work without even faint praise, leaving it to be inferred that he had comparatively failed. Mr. Gosse is known as an accomplished man of letters and a rather mediocre poet; but what are his claims to sit in judgment on the work of the greatest landscape-painter of the day? And what is the common-sense of holding an exhibition to do honour to such a painter, and, at the same time, allowing a literary operator to whittle away (as we heard it expressed) the genius of the artist? We hope we shall have "no more o' this."

NOTES.

THE weekly reports and letters on the state of the dwellings of the poor seem likely to swell into a separate department of tragic and perplexing literature. Elsewhere we notice the views propounded by a writer in the *Quarterly Review*, but the mass of matter in the newspapers on the subject it is difficult to analyse into any definite result. The reports from different persons and different districts are very contradictory as to many of the points that are in question in regard to the method of dealing with the subject, though there is a melancholy unanimity as to the nature of the present facts. A further report of the Brompton Committee confirms, in one instance at least, what has been said and contradicted in regard to the manner in which sanitary officers are hampered by circumstances in carrying out their duties. Dr. Rendle, it appears, who was formerly Medical Officer of Health for Southwark, resigned his position "in disgust," and has since been elected to a seat in the local vestry by the ratepayers who appreciated his good intentions. A long report in the *Newcastle Chronicle* a few days ago gave a detailed account of the inspection of the slums of Newcastle by the Recorder, with a string of hideous facts, including some things which cannot be dealt with directly by existing law; windows in which there was scarcely a whole pane of glass left, rooms in a state of hopeless discomfort from dilapidation, &c.; while the "common lodging-houses" were mostly in comparatively reputable condition. This is a significant contrast, inasmuch as these come much more directly under the operation of the law than ordinary tenements. Miss Octavia Hill announces that she has volunteers for the charge of houses under her system, and hopes to have more. The system of personal supervision of both tenant and tenement is the most effective as far as it goes,—but how far can it go?

A CORRESPONDENCE in the *Temps* of a few days back, between M. Garnier and M. Antonin Proust, one of the members of the committee for arranging the competition for the Gambetta statue, draws attention to a point of some importance in regard to competitions of this nature. The distinguished French architect objects that the proposed monument includes both sculptural and architectural elements, and that these ought to be considered separately. Otherwise, there may be very good sculpture with a very bad architectural composition, or the reverse, and then how is it to be decided? If the judges are mostly sculptors, thinks M. Garnier, they will go for the best sculpture; if architects, for the best architecture: and either way something unsatisfactory will result. There ought, he thinks, to be two competitions, one for the general composition and disposition of his monument, the second for the sculptural figures in detail. M. Proust, in reply, thinks that as the committee addressed itself to French artists without distinction, there will probably be a collaboration of architects and sculptors in the first instance; and as to the committee, they have taken steps to secure equilibrium in the component elements of the jury. There is something in M. Garnier's criticism, however, though the adoption of his plan might lead to some delay and be rather difficult to work practically. The noticeable point to English readers, of course, is that M. Garnier, an architect, remonstrated with an official body on a subject within the range of his special training, and received a polite and respectful answer. We have got quite beyond that in England.

A CLEAR and impartial report on the railway and other plans affecting the Holborn District has been addressed to the local Board of Works by their Surveyor, Mr. Lewis H. Isaacs, F.R.I.B.A. The schemes reported on are four in number. Of these the first is the project of the Metropolitan Board of Works for widening Elm-street, as to the value of which Mr. Isaacs is of opinion that there can be no doubt, provided that it is not allowed to inter-

fere with the formation of a street from the point of intersection of Gray's Inn and Clerkenwell roads to the Angel at Islington. This last is an improvement which has long pressed for execution, the present route *viâ* "Mount Pleasant" being positively dangerous. As to the second scheme, that of a tramway down Farringdon-road, it is pointed out that it would run closely parallel with the Metropolitan Railway, with which it cannot compete either in speed or in price, and that it would be injurious to a large and important frontage, the built portion of which is already of the value of 14,000*l.* a year. The remaining schemes are those of the London Central Electric Railway Company, for a line from Northumberland-avenue, by Piccadilly-circus, to the General Post Office, and of the promoters of the Mid-London Electric Railway for a line from the Marble Arch to Cornhill. The first of these is designed to come so near the surface of the ground as to involve much interference with the roads, sewers, and gas and water mains. The second, laid out at a depth of from 60 ft. to 75 ft. below the surface, would avoid two inconveniences, but would be difficult of access for the passengers. Apart from these objections, and from that of the annoyance caused during the process of construction, Mr. Isaacs holds that these two lines would each supply a great want now felt by London.

THE inquest on the Coppull-lane Bridge accident, as will be seen from the report elsewhere, has resulted in a verdict of "Accidental death," a verdict which has been in several cases, as apparently in this, the refuge of a jury not fully understanding the case, and anxious not to bear hard upon any one. On the basis of reports which may not be entirely accurate or sufficiently full to give the whole bearings of the case, we should hesitate to express too decided an opinion, but we must say that the verdict is hardly in accordance with the conclusion most people would arrive at from the evidence of Mr. Worthington, the engineer for that portion of the London and North-Western railway. He distinctly stated that the bridge inspector had ordered the cutting of the voussoirs too soon; that this should not have been done until they were prepared to let the work down; and that there was no occasion for hurry. He spoke highly, it is true, of the experience and judgment of the bridge inspector generally, and also stated that the mortar appeared not to have been very sound; but he distinctly averred that the accident need not have happened but for the precipitate manner in which the work was commenced. Under these circumstances it hardly appears that a verdict of "accidental death," without comment of any kind, quite represents the nature of the case.

FROM a report in a Liverpool paper it appears that at a meeting of the Liverpool and District Association of Science and Art Teachers, held in that city on Saturday last, a paper was read by the Hon. Secretary, Mr. W. Hewitt, on Prizes and Scholarships, condemning the action of the Science and Art Department in determining to withhold prizes from elementary works and to substitute a few scholarships, tenable at South Kensington School and the Royal College of Science, Dublin. As far as the Art Department is concerned, we are entirely against the views of Mr. Hewitt, and are glad to hear the Department are coming to their senses on that head. The way in which prizes, medals, and "honourable mentions," in all sorts of "grades," have been thrown about broadcast for the common-place work of beginners, has been quite absurd, and misleads pupils into thinking far more of these early efforts than they need.

THE deputation which, on the 10th instant, waited on the President of the Local Government Board to ask for protection from the dangers of overhead wires, did not get very much for their pains. If a measure for changing the form of Government for the metropolis should come before Parliament in the ensuing session "it would probably be the duty" of Sir Charles Dilke "to consider the question from the point of view of the metropolis, but he would be able to speak more definitely when the result of the legal proceedings taken by Marylebone and other parishes became known." Meantime the Post-Master General, it seems, has power to stretch and lay wires for telegraphic purposes where he chooses; and public and private enterprise, without any such authorisation, is visibly doing the same. If matters go on as they do a perfect spiders' web of metal wires will be woven over the roofs and streets of London. And not only will the strands of this web, when they happen to break, cut any one on whom they may fall as with the blow of a sabre, but, if they be conveying electricity of high tension, and only get a little out of place, the consequences may be no less disastrous.

WE have received a letter from a correspondent in regard to our article on "The Enfranchisement of Leaseholds and Compensation to Tenants for Improvements." The gist of this communication is the question, "Who is to say what are improvements?" It may be useful to point out that in any Act dealing with this question, either a definition of improvements would have to be given, or they would have to be classified in a somewhat detailed manner, as in the Agricultural Holdings Act, which has just come into operation. This latter Act has finally put an end to the idea of many, we do not say all country landlords, that they have a right to get as much money out of their farms, and do as little for their tenants, as possible; and urban tenants have so vastly multiplied that they are not likely to allow the old theory to remain long in force in the towns.

THE Board of Trade, in accordance with the general opinion of the various local authorities of the metropolis, has intimated its official disapproval of the scheme for the amalgamation of the South Metropolitan Gas Company with the Gas Light and Coke Company. The announcement may be taken as a declaration that, in the opinion of the advisers of the Board, the possible economy to be effected by the consolidation of the administrations of the two companies was not so great as to allow of any reduction in the cost of producing gas that would compensate the customers for the increased powers sought by the companies. As to this there is no doubt that the amount of the possible saving to be effected by the amalgamation of either gas or water companies has been ridiculously over-rated. On the other hand, anything that should deprive the consumer of the advantage of the equitable bargain now existing in so many cases between the gas companies and their consumers, which is at the rate of an increase or diminution of 4d. per 1,000 cubic feet of gas for every 1*l.* per cent. of dividend, is one too obviously in the interest of all parties to be infringed on by a side wind.

THE "Société Centrale des Architectes," which was founded in 1840, "pour créer une distinction morale entre les architectes et ceux qui prétendaient l'être," announces a congress of architects, under its auspices, and in accordance with its provisions, but specially under the auspices of the "Société des Architectes et des Ingénieurs des Alpes-Maritimes," to be held at Nice from the 8th to the 12th of February. The list of subjects to be debated indicates the questions which are prominent just now in the consideration of the architectural profession in France. They are (1) the reform of the legislation affecting architects and engineers practising as architects; (2) the idea of a compulsory diploma for all persons practising architecture; (3) the means for bettering the education of builders and building operatives; and (4) the professional charges of architects. The first of these questions is one on which there is, among many French architects, a stronger and, we may add, a more chivalrous feeling than we commonly find in this country, a greater readiness to accept responsibility as the guarantee of public confidence. The second we have dropped as impracticable; the third we have not taken up; the fourth is a "burning question," and it will be curious to see in what direction French opinion runs,—whether towards percentages or fees.

COMBINED LAND AND WATER TRANSPORT IN INDIA AND ELSEWHERE AND ITS RELATION TO INDUSTRIAL PROSPERITY.

INDIA is getting the start of Great Britain in making practical use of the information which has been collected and published by the Select Committee on Canals of last session. The great activity which is now displayed on the continent of Europe, especially in France, and in the United States, in providing manufacturers with the cheapest methods of transport, has not hitherto awakened much practical interest in the United Kingdom beyond the limits of the manufacturing districts themselves. And even here people seem waiting to see the result of the lead taken by Manchester. On the other hand, India possesses a system of railways which, as far at least as passenger traffic is concerned, are at once the cheapest in the world, and the most satisfactory as to their commercial outcome. With lower fares and lower freights than in the United Kingdom, some of the great Indian railways are worked at 10 per cent. less cost; and that 10 per cent., being calculated on the gross income, is really 20 per cent. on a comparison of the expenditures alone. No doubt the chief cause of the difference is the comparative cheapness of labour in India. Our usual calculation, which will be found first put distinctly forward in the "Work and Wages" of Sir T. Brassey, as taken from the ample experience of his father, the great contractor, is to the effect that the rate of wages does not make a material difference in the cost of work,—the better-paid man doing proportionately more work. As far as the mere exertion of strength is concerned, as in filling wagons, wheeling barrows, and the like, the view of Mr. Brassey is fully confirmed by the experience of half a century. But when skilled labour is required the case is different, and the experience of the Indian railways, on which natives have been gradually trained, under English workmen, to drive locomotives and to discharge other functions of which, twenty or thirty years ago, the Englishman had almost a monopoly, shows that what costs a shilling in England can often be done for an anna (1½d.), or even less, in India. And thus a very good profit is earned by carrying passengers at ½d. (one-third of a penny) per mile, and even under that rate.

It speaks well for the enterprise of India that her men of business are not content to rest on their oars, satisfied with having so far beaten the mother country in the application of the most important of modern inventions. The immense water system of India allows of the solution there, on a very large scale, of problems of which the vital importance to the future of mankind is to some extent masked by the small size of the area of the British Isles. Thus, where we have an average rise, in running across the country, of from 10 ft. to 16 ft. in a mile, the long reaches of the Ganges Canal only fall at the rate of from 15 in. to 18 in. per mile, for sections of twelve and fourteen miles in length. Where we obtain from 45 ft. to 60 ft. in width for a water-way, an Indian canal is from 200 ft. to 300 ft. wide. Irrigation, too, little needed in this country, is in many parts of India essential to the agriculturist. It is thus not surprising that Indian men of business and of science have taken in hand the supplement and completion of the railway system by its older and not less important sister,—the canal system. The instance which has attracted our notice is the proposal to constitute a "Bengal Central Flotilla Company," with the object of establishing a river steam service in the delta of the Ganges, which the prospectus says may be regarded as a complement and auxiliary to the railway lines of the Bengal Central Railway Company, now about to be extended to Khoolna. In happy contrast to the internecine strife between the canal and the railway companies of England, the Bengal scheme is brought forward under the auspices of the railway company, and will have the same board of directors and officers. The tract of country to be served by the flotilla covers an

area of 5,000 square miles, with a density of population amounting to 500 souls per square mile, or about two and a half milllions of possible customers. A daily service is to be established between Khoolna and the capital and chief centres of the district. The Post-office is to pay 400*l.* a year for the carriage of mails; and subventions of from 120*l.* to 600*l.* a year are offered by the various municipalities, on condition of the maintenance of a daily service, at fares not exceeding those charged by the railways. The sixty-two miles of the company's lines from Bongong to Khoolna will probably be opened on January 15th, which will place the last-named station in direct railway communication with Calcutta.

The capital for this undertaking, which only amounts to 100,000*l.*, will no doubt be raised in the locality; and it is not in the character of an investment that we call the attention of English readers to the scheme. The interest is far deeper than that which attaches to making one or two per cent. more or less on a given capital in a year. The mode in which we regard it is as an industrial phenomenon. India had attained a high degree of civilisation when the greater part of Europe was covered with impenetrable forest; and the people of India have attained an excellence in many kinds of workmanship to which Europe can show no rivalry. The famous Dacca muslin, for instance, is a woven cobweb such as no machinery has ever been able to produce. In India, moreover, cotton is indigenous. Not only so, it is the proper textile material of the country. Linen goods turn yellow in India; while cotton goods, under the fierce influence of their native sunbeams, preserve a beautiful whiteness. This is the reverse of what happens in the United Kingdom, where linen,—a natural product of the soil, and a most remunerative crop in large districts of Ireland,—is as much the natural textile production as is cotton in India. What we think may be with some confidence anticipated, sooner or later, is the wedding of English capital and English science to the cheap labour and delicate manipulation of the Indian workman. The result bids fair to be the re-establishment of the prestige of Indian wealth, at all events, as far as those industries go which are appropriate to the climate. We are not without examples of this combination, although we are told that they are due to French rather than to English enterprise. The cotton factories of Pondicherry, wrought by steam power, are said to produce better and more durable napkins, table-linen, and the like, than Europe can make out of cotton. The whole history of the railways of India seems to us to indicate the probable rise of a great manufacturing industry in the great peninsula; an industry with which colder climates, with dearer labour, and the need of importing the raw materials, could by no means, in the long run, successfully contend.

If this be so,—and it will need a very strong case to disprove the view,—it offers but one more of those lessons, alike to the statesmen and to the manufacturers of England, which can only be neglected or misread at the risk of serious disaster. It tells us that, much as we undoubtedly owe to the unrestrained energy of private enterprise, such enterprise has a very sharp limit of success, or of duration, unless it be founded and maintained in accordance with the true principles which secure or forbid success. Physical conditions are not, in the long run, to be altered or evaded, either by the legislator or by the capitalist. Stories are well known of sanguine and resolute men, who have sunk fortunes in mining for coal in localities where the geologist could have told them in advance coal would not be found. Capital was there, and energy, and perseverance,—but there was not coal; and the effort was necessarily vain. As in the search for coal, so it is in the attempt to establish or to maintain any great industry. The knowledge of the expert is needed to insure permanent success. It is no reply to say that for generation after generation such and such an industry has been carried on at such a place, and that therefore it will always there flourish. That might, perhaps, be safely predicted, if circumstances remained unaltered. But we think few persons have realised,—we can call to mind no great public speaker or writer who has at all realised,—the character of the physicial revolution which is going on around us. Steam has so far reduced distance as to place every part of the world in a relation to all other parts entirely different from that which it occupied at the beginning of the present century. Land travel has been reduced in cost to less than one-fifth of its former rate, and the speed of transport by land has been more than quintupled. By sea, certain punctuality has taken the place of that old dependence on wind and tide that made the labour of the mariner almost as uncertain as to its results as the wheel of the lottery itself. And the cost, for long ocean ranges, is reduced to something fabulously low. Under this new *régime* the natural advantages of each part of the world have a play which was undreamed of when we were busied in talking about the effect of changes in the laws, and vainly thinking that we could stimulate or control the operation of something far mightier than tariffs or fiscal rules. Before Brunel bridged the Atlantic, it mattered comparatively little at what rate of duty American corn should be admitted to our ports. Nor is it a matter to be settled at Westminster how far we shall continue to supply the markets of the world with textile fabrics, with iron, with steel, with machinery. Year after year such questions are settling themselves. Year after year local advantage more and more asserts itself. Who would have said, when George Stephenson was advocating, and the Aire and Calder Navigation Company were opposing, the North Midland Railway, that before the close of the century the ancient monopoly of steel manufacture would be reft from Sheffield by that very power of steam transport; and that the new canon would be laid down for the industrial manufacturer of England, "Either seek the sea-board, or bring the sea to your door."

But while statesmen and public writers have shut their eyes to what was going on around them, or only so far troubled themselves with it as to attempt to draw arguments for this or for that political cry from the symptoms of constitutional change in our industries, the builder has been more alive to the course of events. We mean, of course, the builder as the impersonation of the building trade. A change in the centre of gravity of the population is in course, and it is chiefly from our want of experience of the effects of such inventions as the telephone that we are unable to anticipate with certitude some of the details of that future change. We know, indeed, one or two of the controlling conditions. No place is likely to attract the builder's efforts that is not well served by railway communication. The need for telegraphic service has been acknowledged. The yet superior advantages of the telephone are well understood already in many places. How far this latter expedient may enable men to dispense with personal interviews, is the question that will decide whether our great cities and towns will continue to increase in an accelerating ratio; or whether habitations will spread more over the face of the country. And no less certain is it to those who take a comprehensive view of the case that water access,—by sea, river, or canal,—is becoming a prime condition for the situation of any factories in which matters of heavy weight are manipulated or produced. As to that there can, we think, be no doubt. It is of especial interest, therefore, to see how India acts in this matter. We do not say that Indian manufacture is likely, for perhaps many years, to compete with the cotton trade of England, except in the markets of India itself. But we say that, with certain exceptions, the conditions to be found in India are more favourable for a great manufacturing cotton industry than are those to be found in the United Kingdom. Our special advantages are:—First, coal, as to which we have no monopoly, and the use of which, in many cases, is likely to be superseded by petroleum. Secondly, the special skill, excellence, perseverance, and workmanlike qualities of the English workman. These, it is but too unfortunately well known, he has been disastrously counselled to postpone for other occupation of his time, with the view of raising his position, not by industry, but by political strife. The great elements of success or of failure to which we have referred can only be infinitesimally affected by the politician, even giving him all he asks. What can be done to keep our start in the markets of the world has to be done by industry,—industry under its three heads, that of the brain, as engineering science and skill; that of the arm, or patient, persevering, and well applied toil; and that of the pocket, the stored-up outcome of industry, which is needed to facilitate the working of the other two. In all these we have to do our very utmost. If we thus pull together, we may fight the world for years, for decades, perhaps for centuries. But we have not an ounce of power to throw away, and unless we, all of us, not only do our best, but do it under the best advice, we shall drift, year by year, more hopelessly astern. And in thus doing our best we have to bear in mind that the conditions of maritime accessibility, which have been among the chief elements of our national welfare, have been affected by the change in the means of transport due to the locomotive. In the Appendix to the Report of the Select Committee on Canals (p. 232) will be found a table giving a comparative view of communications by land and by water in seven different countries. A special comparison of accessibility is found in that table, arrived at by dividing the area of the country by its sea-coast line. Thus, while England has 24 square miles of area to every mile of coast-line, France has 74 miles to be served by a single line of coast. If this view is carried further, and if we extend the coast-lines up the navigable rivers, we arrive at an element in the prosperity of different countries which is newly coming into prominence, and which has a weight of a remarkable kind. No railway extension,—according, at all events, to the view of Continental statesmen,—can weigh against the great feature of maritime accessibility; and it should be very instructive to us to see how this important fact is practically grasped by the directors of railways in Bengal.

THE FABRICATION OF THE ANTIQUE IN ART AND HANDICRAFT.

LITERARY forgery, if not as old as the hills, is at least an artifice of long standing. Though deception has been practised for several centuries in palming off inferior material and indifferent workmanship with the object of obtaining the best prices for the cheapest and least enduring work, the system of fraud was somewhat limited down to a late date. Some of our olden statute laws were very severe, and in connexion with our ancient guilds of trade the regulations were stringent and the penalties heavy for those masters and workmen who were found turning out work in their respective trades to the manifest damage and injury of the public. The era when good masters and men felt scandalised by the doings of the odd scamps in their respective trades we fear has long past, and we have hundreds, nay thousands, of producers and distributors in our midst who look upon deception wherever it can be practiced with impunity and without detection, as a matter of "business." Thus we have fabrication in various fields of art and handicraft at the present hour, and a large purchasing public ready to believe in any assertion. People who are unwilling or ashamed to acknowledge their ignorance of the value of what they buy, are not the less easily duped. It is a good many years now since "Flint Jack" drove a good trade in fabricating tools, weapons, and other antiquities of the Stone Age. Before the roaring trade of the notorious Jack had a little clear light let in upon it, many a local antiquary, many curators of provincial museums, prided themselves on their lucky purchases, but though their illusions did not last long, it is a matter of certainty still that not a few private and public collections have a good many fabricated antiques on show. For several years past, in London, excavations occurring by the construction of railway works, and in sinking foundations for the deep basements of public buildings and warehouses, have led to the unearthing of *bonâ-fide* "finds" in coins, pottery, pavements, and other objects of the Roman occupation. The demand, however, of late years on the part of dealers in antique articles has exceeded the natural supply. The excavators, building labourers, and others engaged in work of the kind we have mentioned, knowing the desire that exists, are seldom without a few odd coins and other old metal knickknacks in their pockets to dispose to the hunters after relics, who will often be found nowadays in the City hovering over new building foundations. Many real coins are undoubtedly unearthed on the exact sites where they are sold to dealers and relic-hunters, but that many more are not we have good reasons for knowing. We have plenty of coiners of counterfeit coin of base metal in our midst; to what extent the

fabrification of antique coins obtains in this country we are unable to say, but that certain fabricated specimens have been produced from time to time there can be but little doubt. Common report credits Birmingham as the source of these sham antiques.

There are a number of poor or rather unfortunate artists in London and other cities who are in the hands of dealers in old pictures and paintings, and these artistic hacks are generally employed in the reproduction of the works of distinguished painters of a bygone day. Even copies of some of the Old Masters are executed to be sold as originals at auctions or to private purchasers. Among the class of paintings called "pot-boilers," which are produced by needy hack artists, are numerous landscapes and portraits and historic scenes. A number of this class of paintings, even though they may be termed original in one sense, are sold to purchasers as the works of painters who never painted them. They will probably give all the delight they are expected to give when hung in the drawing or sitting room of the retired tradesman who purchased them for the edification of himself and his amiable wife, who desire to show their visitors that they are lovers of fine art and patrons of our British artists. It would be well, we think, for our living and distinguished artists who wish to prevent fraud after they have passed away to adopt some system of registration in respect to their works as would place it beyond doubt what they actually produced in their life-time. Good judges of the works of the old masters exist in England and abroad, but genius is versatile in the fields of fraud as well as in honest art, and deception is always possible. The adept forger of an autograph is often successful, at least for awhile; and we must expect the same success for the skilful fabricator of a painting intended to pass as the original of a celebrated artist instead of a clever copy. The fabrication of entire works in sculpture, large or of life-size, for the purpose of deception or antiquarian "finds" has perhaps been rarely, if ever, attempted, though considerable suspicion exists concerning the discovery of minor pieces of sculpture unearthed or brought from abroad. Torsos, legs, arms, and other pieces of the works of our ancient sculptors, have been excavated on historic sites, all bespeaking in their execution the workmanship of the Greek school, but, on the other hand, specimens of divers forms of ancient fictile art have reached us, and find a place in our collections, and of some of these we have no warrant that they may not have been imitations. A plastic material like clay, that can be readily moulded by the hands of the potter or the artist in stucco, affords facilities for fraudulent productions and their reference to a school to which they may not belong.

In the matter of the fabrication of antique furniture, or specimens of the cabinet and joinery work of the Elizabethan, Jacobean, Queen Anne, and Georgian periods, a high state of art and handicraft deception has been reached in London. The district where this class of counterfeit furniture is sold (if not manufactured there in all cases) is well known. We will not be invidious in mentioning streets; for, though much fabricated and vamped old furniture is on sale in the quarter alluded to, there are also at times some *bonâ fide* specimens of the Elizabethan and subsequent periods to be purchased in these antique furniture ware-rooms.

Whenever an old mansion of the Queen Anne or Early Georgian period is about to be demolished to make room for the speculative buildings of the present time, the fabricators of antique furniture, or their agents, are on the alert for bargains. That peculiar individual or contractor who has made his appearance in the building world of late years, and is known as the "house-breaker," and who is ready either to do the work of demolition for another, or to purchase the house and demolish it himself, with the hope of making a good profit on the sale of the different materials, pioneers the way. The slates, bricks, stone dressings, doors and window-sashes, lead, panelled wainscoting, or wall-linings, staircases, twisted balusters and massive handrail and scroll, and so forth, are apportioned in lots for intending buyers. The antique furniture fabricator is chiefly concerned about the obtaining of the old panel-work mouldings, twisted balusters, moulded handrail, and massive scroll. If the joinery work is in oak, so much the better, and the greater the value. It does not matter if the old joinery work is somewhat worm-eaten, for it will save the fabricator or his workman, the "worm-eater," a portion of the time required in perforating holes in the manufactured article to give it the appearance of the antique. Silk-worms can be cultivated with advantage; but science, to the great loss of the fabricators of antique furniture, has not yet discovered a method of utilising the labours of our wood-boring insects in a systematic way. Wood-boring beetles will only bore where and when they like. If they could be made to go to work *en masse* on a piece of antique furniture, and perforate or riddle it here and there where the fabricator will, the beetles would be a valuable class of insects for at least one class of the community. It may be asked, is a love of moths, beetles, and rottenness a sign of civilisation, even supposing they were all embodied in a genuine piece of antique furniture? The counterfeit cabinets, chests of drawers, side tables, chairs, and ladies' work-boxes, with their elaborate arrangements and secret drawers and sundry other objects, are now fabricated in the antique style in old moth-eaten timber or of wood counterfeited for the purpose. Although *bonâ-fide* furniture turned out by the old cabinet and chair school of Chippendale, Sheraton, and Hepplewhite are to be picked up occasionally at auctions and at the warehouses of dealers, there are now a good many imitations of this school to be found in our cabinet warehouses, and some good and solid imitations too. Still, in our cabinet and chair industries there is a very large amount of furniture of the most flimsy and wretched character thrown upon the market, and the small chamber-masters and workmen who manufacture this furniture for some of the large firms receive prices abnormally low. Let us not be understood as saying that these smaller makers who manufacture pieces of furniture for the large firms, or on "spec" or chance of sale, do not turn out any good work. They do turn out betimes excellent work, and are capable of doing honest labour, but they are martyrs to circumstances, and often, from the depression in their trade, they are obliged to sell their manufactured work to a class of grinding dealers who take advantage of their necessities and allow them scarcely any profit for their labour. Tables and cabinets, and suites of chairs and couches, are often manufactured of hard common woods, then stained and sold as fancy wood articles to purchasers who are easily imposed upon, through their inability to distinguish a doctored wood from the real wood. Those who do not know one description of mahogany from another, or real walnut, cherry, or laburnum from the pseudo stuff, should consult or employ those who do, or otherwise insist on a written guarantee that the piece of furniture they are buying is in workmanship and material what the manufacturer or seller asserts it to be. Then there would be a remedy, as the law provides a penalty for the obtainment of money under false pretences. There is a low class of second-hand furniture brokers who are also in the habit of manufacturing or getting made for them flimsy furniture in a rather old style, and by certain washes giving the new cheap mahogany or other wood a very dark and old appearance. Many persons who are on the look-out for fine old second-hand furniture, "as good as new," as the phrase goes, are taken in by devices of this kind practised by a tribe of unprincipled scamps, some of the fraternity being in league with mock auctioneers.

We could furnish many details of the fabrication of objects of art and handicraft, but what we have revealed, or might still reveal, would not of itself effect a radical reform. Cheap Jack is in unwholesome competition with honest workmanship, and ignorance in matters of art, fine and industrial, is still rife in the land. Men and women assume a knowledge of art and manufactured products that they possess not, and being too proud or too parsimonious to consult an authority to guide them in their selections, they find, when too late, their money has absolutely been thrown away in the procuration of sundry rubbish. Let no one be deterred from what we have written in adorning their homes with objects of art and skilled workmanship. Of olden and modern artistic creations, and of splendid workmanship of the craftsman's hands, are plenty of specimens in the land. We have living artists and workmen, too, who are capable of doing all that may be reasonably required of them. We want, however, more of that kind of education that inculcates moral dealing, and that will evidence itself by men feeling themselves ashamed to be found out in doing an unprincipled act. The impartial administration of the law in the meantime may deter evil doers, whether they be common forgers or dishonest fabricators, of objects in the fields of art and handicraft.

HONOURS TO ARCHITECTS.

IT will, we think, be generally admitted that in this country architects, in common with their brother artists, the painters and sculptors, have not been much favoured by the honours which it is customary for the sovereign from time to time to distribute. It is true that knighthood has been not sparingly bestowed upon the profession from the days of Sir Christopher Wren. The names of Sir William Chambers, Sir John Soane, Sir William Tite, Sir Jeffry Wyatville, Sir Matthew Digby Wyatt, Sir James Pennethorne, Sir Robert Smirke, Sir Charles Barry, and Sir Gilbert Scott crowd instantaneously on the memory; but beyond this far from satisfactory stage of "ennoblement," royal favour has never ventured.

We all remember how Thackeray regretted the absence in our country of a "decoration" equivalent to the Legion of Honour in France, and the question remains still in the same unsatisfactory position. Very justly, poets-laureate, as well as wealthy brewers, are considered not inadequate representatives to swell the benches of the Upper House, but knighthood is regarded as a sufficient reward for artistic merit.

We, in England, are not accustomed to regard matters from a more strictly aristocratic point of view than the Austrians and Germans, yet it is somewhat singular that in this direction a far more appreciative and flattering view of the artist's place in the social economy is taken both in Germany and in Austria. In comparison with our merely distinguishing knighthood, shared literally by all sorts and conditions of men, the hereditary and ennobling "Von" confers a dignity which may be said to be of a truly enduring nature and of far more meaning than its mere grammatical equivalent "O'," "Mac," "Ap," "De," "Di," and its numerous polyglot variations.

Only a short time since reference was made in these pages to the great architectural improvements which have been carried out in Vienna. On the Franzen's Ring, in which the chief monuments of the new capital have been erected, the Votiv Kirche and the University are the work of the late distinguished architect, Von Ferstel, ennobled some time ago as a Freiherr or baron solely on account of his professional eminence. The venerable architect of the newly-erected Houses of Parliament was knighted for his services, Ritter von Hansen. Hasenauer is, if we mistake not, also a Freiherr and a "von." It is only from the strength of his convictions that Schmidt, the architect of the new Rathhaus or town-hall, refused the title offered to him by the German emperor, and it was on similar grounds that the late lamented architect, Semper, died a simple Herr. As we write, there occur to our mind the names of the Ritter Heinrich von Förster, Carl von Lützow, Ritter von Rigel, von Gärtner, and von Klenze (the favourites, it may be remembered, of that princely patron of art, Ludwig of Bavaria), the Freiherr von Socken, and von Gerstner, the eminent engineer.

The list would be long indeed were we to mention a tithe of the distinguished French architects who have received the honour of the various grades of the Legion of Honour. As was announced in these pages a few days since, the venerable Dean of the architectural section of the French Academy of the Fine Arts, J. B. Lesueur, died an officer of the Legion of Honour. At the present moment, among his late colleagues, M. Ballu is "commander" of the same order, as also M. Bailly; M. Garnier is an "officer" in company with M. Vaudremer, M. Questel, and M. Abadie.* It is noteworthy, by the way, that one of the most eminent of the foreign associates of the French

* Only a few days since the French *Journal Officiel* announced the nomination as Chevalier of the Legion of Honour of M. Paul Fouquiau, the architect of the Amsterdam Exhibition, of the greater part of the new Quartier Marbœuf in Paris, as also a large number of *cités ouvrières* or artisans' dwellings in the French capital.

Academy, the venerable Professor Donaldson, has, like more than one other English artist, received from a foreign nation a far fuller acknowledgment of his services to art than from his own countrymen. It may be mentioned in this connexion that John Martin, the painter, was, in company with Lord Durham, the first Englishman to receive the honour of the knighthood of the Order of Leopold on its formation. The recent deaths of the Chevalier Albano and the Conte Vespignani, the architect of St. Peter's, will be present to the memory of many readers.

It is now happily an exception rather than the rule for authorities in power to hold out two fingers to an eminent architect as a Minister many years ago is known, let us hope thoughtlessly, to have done to the deceased architect of the now so sadly-abused Law Courts, yet the unfortunate incident is, perhaps, not untypical of the light in which the ill-trained English mind regards the artist, using that word in a sense in which we feel it quite possible that we may be misunderstood, so little do we in our country appreciate generally the ordinary vocabulary of art. Stoutly as the architect would claim the right to be an artist, we wonder how many persons in a representative English drawing-room would mistake his claims to the title if it were explained that never in his life had he painted a picture?

THE CIRCULAR OF THE TOWN CLERK OF THE CITY OF LONDON AS TO THE CORPORATION WATER BILL.

IT is difficult to read the circular addressed by Sir J. B. Monckton, the Town Clerk of the City of London, to the various local authorities, without coming to the conclusion that the writer or writers have not taken the trouble to read the evidence on the subject with which they propose to deal that is contained in the Blue Books. Otherwise they could hardly prepare so violently to force an open door. For it is clear in that evidence that the best servants of the water companies,—taking such a man, for example, as Mr. James Muir,—are as anxious, in the interests of their own shareholders, to effect certain changes, as the officers of the Corporation can be. Only, having a practical acquaintance with the subject which the outsiders have not, the engineers of the companies are aware where the real difficulties lie,—difficulties of a nature with which Acts of Parliament are wholly unable to contend.

Thus no one more deplores the waste of water than do the water companies' engineers. No one could be more desirous to take measures to prevent it, and to restrict supply within strictly useful limits. For waste is injurious, not merely as causing loss of water, but as deteriorating all connexions, pipes, and fittings. Thus the introduction of constant supply is an object which the water companies have shown that they have much at heart. And if any practical mode of selling water by meter can be pointed out, it will no doubt be welcome as tending to prevent waste.

But here comes in the constant difficulty,—"Who is to pay for the cost involved?" The companies might, it may be said, supply meters as do the gas companies, on rental. But who is to pay for the cost of fixing, which is a much more serious matter under a pressure of 100 ft. or 200 ft. of water than under the half-inch of water pressure required for the flow of gas? And how much will be added to the 6¾d. per 1,000 gallons at which Sir J. B. Monckton averages the cost of the London water supply, in order to pay the rent of the meters?

The first clause, then, of the Bill, appears simply to evince ignorance of the nature of the difficulties which all parties desire to see removed. As to the other three clauses, the question arises whether the introduction of a hostile measure on the part of the Corporation is the best mode to attain their objects. These clauses must be one of two things,—decleratory of the law, or modificatory of the law. In the first case, supposing them to be passed, an appeal to the courts of law will be the first result. No brand-new legislation is at all certain as to its effect until it has thus been tested and overhauled by the practical wisdom of the tribunals. A declaratory Act, then, in the present circumstances, is mere waste of time and money, as the opinion of the Courts, which decides the application of the actual law, can be obtained as readily at the present moment as it can after a new complication is added to the statute-book, by way of "declaration."

If, on the other hand, the Corporation seek not to declare, but to change, the law, it should not be attempted by a side-wind. The whole matter will, no doubt, be obstinately contested by the water companies; and not only so, but to a great extent the sympathies of all the owners of property will rather be with the latter than with the Corporation, whose sudden zeal for reform in the matter may provoke some question. The true ground on which to fight against any increase in the legal powers of the water companies, or to endeavour to obtain any better terms from them, is that of the introduction of Bills by the latter for the increase of capital. In the case of each of the companies, such application must be made within four or five years at the outside. Then will be the time for water consumers, local authorities, or other *ayants droits*, to intervene, if only the public knows what it really wants, without undue expense or suspicion of any undeclared motive for action.

THE OLD CHANCERY COURTS, LINCOLN'S INN.

HE who has not passed through Lincoln's Inn during the last two or three months, will now see that in the interval the Law Courts there have disappeared. Their functions, indeed, had ceased with the opening, some twelve months since, of the neighbouring Royal Palace of Justice. The ugly building which not only disfigured Old-square, but obstructed a view of the chapel and old hall, Lincoln's Inn, was erected in 1841, when, by an Act of that same year, two additional vice-chancellors were appointed, owing to the rapid increase of Chancery business. With the death of Sir Lancelot Shadwell (August 10, 1850), the style and dignity of Vice-Chancellor of England died too. He used to sit in what the present generation best know as the late Vice-Chancellor Malins's Court, being that near to the Brewster memorial gates, set up in 1861 at the southern side of the garden. That court was erected in 1819, the outer corridor, a portion of which remains, having been built at the same time. It was designed in conformity with the more modern aspect of the old hall and adjacent council-chamber, as transfigured and defaced at the hands of Bernasconi in 1800. Just thirty-two years ago two new judges were appointed, with the style of Lords Justices of the Court of Appeal. They, together with the Lord Chancellor, occupied two courts made out of the once "goodly hall," which, itself the most ancient existing part of the Inn, was built 22nd Henry VII. in place of one that had been pulled down some ten years previously. Frequently altered, lengthened by 10 ft. in 1819, a coved ceiling substituted for its fine, open oak roof, and finally despoiled of its heraldic achievements in stained glass for decorating the eastern oriel of Hardwick's new hall (1845), it is difficult to picture the fabric as it was in the days of dancings and revels of Queen Elizabeth, or of the grand entertainment given here in 1671 to King Charles II. and the royal princes. What yet survives of Old-square is singularly picturesque, affording some fine examples of Tudor and Jacobean brickwork; though amongst the best were the chambers recently removed for the lengthening of the chapel, and those which have given way to Sir George Gilbert Scott's latest work. But here again we look in vain for the former arched doorways, and find that sashed windows are but a sorry exchange for the original lattices and stone mullioned windows, of which latter two, however, remain *in situ* just south of the gatehouse, Chancery-lane. The Six Clerks have gradually exhausted their liberal pensions; the Record and Writ Clerks are become Masters of the Supreme Court; the Benchers have retaken possession (for chambers) of their former premises in Stone-buildings, and, it is said upon the agreement to recover at no advance upon the original sum. In this case, bearing in mind the greatly-enhanced value of property here, the authorities of Lincoln's Inn are to be congratulated upon a transaction to them so profitable.

St. Mary's, Witney.—A series of stained-glass windows, from the studio of Messrs. Clayton and Bell, has been placed in the chancel of St. Mary's Church, Witney.

FOREIGN NOTES.

THAT the serious and absorbing character of the architect's pursuit may, without injury, be enlivened from time to time by a little harmless gaiety, is, we think, amply shown by the life of the late eminent architect, J. B. Lesueur. Since his death a great deal has been said concerning his many services, professional and literary; but though a compatriot has, it is true, informed our readers of the late architect's skill as a poet, few are aware that Lesueur was the founder of that joyous social corporation, still alive after considerably over half a century of existence, which, bearing the pompous designation of the Société Amicale des Pensionnaires de l'École de Rome, is more familiar to the artists of France and Italy by the less dignified title of *La Soupe à l'Oignon*, and fewer still, we expect, know that the grave and learned member of the French Institute was, quite late in life, the author of the song in praise of the homely onion, which gave its name to the society, a song which is still fresh in the memory of the small and select body of the initiated into the secrets of this almost Freemasonic body. The constitution of the society carries us back to those good old days of unaffected simplicity and *cameraderie* between artists which it is complained, and not unjustly, are fast becoming a memory of the past. As long ago as 1817 a party of the young French students of the historic Villa Medici, at Rome, had planned an excursion to the *campagna* which surrounds the Eternal City. Encamped under the shadow of the so-called tomb of Cecilia Metella, the neighbouring *osteria* or inn was discovered to have nothing to feed sixteen hungry students but a basketful of onions. It was here that the genius of the young architect, Lesueur, showed its latent ability for the mysteries of the kitchen, and before long a fragrant onion soup was served to the united party within the classic walls of the old tomb. Washed down by some of the honest white wine of Grotta Ferrata, the feast served as the foundation of the society to which we have alluded. Lesueur appeared in a new capacity as poet, and in a series of humorous alexandrines sang the origin of the society, which from that moment was constituted on bases which have stood the test of hard on sixty years; the society still meets in Paris on the first Wednesday of every month. A great many years ago M. Lesueur once again developed his poetic vein in the song, "Vive l'ognon," and which, sung to Béranger's famous air of "Les gueux," tells the praise of the humble vegetable. Considerations of space forbid our reproducing the poem; one verse must suffice:—

"Quand sur des sables arides
Du temps bravant les fureurs
S'élevaient les pyramides,
Qui nourrit leurs constructeurs?
L'ognon! l'ognon!
Digne de renom,
Nous donne son nom.
Vive l'ognon!"

Not only the artistic world but the crowd of travellers who at this season hurry southwards to the overcrowded Riviera, and, let us add, the still more numerous readers of Bulwer's "Rienzi," will hear with pleasure that steps are to be taken by which the picturesque palace of the popes at Avignon will shortly cease to be desecrated as a barrack. At a recent meeting of the French Commission of Historic Monuments,—a body the formation of which we still await in our country,—M. Boeswillwald, the well-known architect, reported the desire of the municipality of Avignon to convert the papal palace into a national museum. The report will be submitted to the Minister of War,—the palace being as above stated at present occupied as a barrack,—and there is every hope that before long the romantic old pile will be restored to a condition more in consonance with the many historic and artistic memories associated from Mediæval days with its feudal gloom. Were there, however, no traditions of the presence of Giotto, of Petrarch, and Rienzi, and the splendour of the exiled papal court to lend the halo of romance to the ruined palace, its architectural interest alone would merit a worthier fate than has so far befallen its battered but still stout walls; all lovers of the beauty of Mediæval art will, therefore, join in rejoicing at the promised restoration,—rather let us say, in view of the bad odour in which that word is held by some, conservation,—of the palace of the popes at Avignon.

The series of disrespectful smart things suggested by those two grand architectural creations of recent days, the Law Courts of London and of Brussels would seem still far from exhausted. We in our country have, it is true, already grown a little wearied of the subject, though there are grim wags who are still to be found chuckling over the,—according to them,—well-merited sufferings of the lawyers in their new home at Temple Bar. In Brussels, however, the new Palais de Justice is still sufficiently an "actuality" to afford a novel fund of attack for the satirists. The latest piece of humour which has reached us is a clever sketch of an unhappy prisoner in full evening dress being brought into court between two magnificent *gens-d'armes*, "sables and starch" being assigned to the culprit as necessary to be in complete harmony with the grandeur of the general design.

We learn, by the way, that the architect Beyaert is to be entrusted with the rebuilding of the recently destroyed Belgian Palais de la Nation. Beyaert, it may be remembered, is, among other works, the architect of the Banque Nationale at Brussels.

We are reminded of a question, which has often excited discussion in this country, the many absurdities of our metropolitan street nomenclature, by the recent action of the Paris municipality in determining to give to one of the streets of the French capital the name of the venerable, and, happily, still living savant Chevreul, to whom the artistic world owes something more than an ordinary debt of gratitude for his many admirable discoveries and his scientific study of the laws of colour. "Le bon papa Chevreul," who is now no less than ninety-eight years of age, has, under circumstances which have excited some little indignation, been deprived of the post he has long held as Director of the Gobelins Tapestry works, where he has delivered those interesting lectures which have revolutionised the older theories of the harmony and contrast of colour. No artist, no artisan, no designer, and no critic can afford in the present day to be unacquainted with the researches of Chevreul, and, complicated though they may appear in their definition, their mystery, once grasped, places the student in a position of such manifest mastery over the subtle laws of colour, of contrast and harmony, as to give him an advantage which none in these days of fierce competition can afford to forego. The Paris municipality, in determining to honour Chevreul by giving his name to one of the thoroughfares of the French capital, has not only acknowledged the merit of the venerable savant, but, to return to the statement at our outset has helped to solve a question which, in this, country, has more than once come under discussion,—the absurd and puzzling anomalies of our street nomenclature, with its innumerable King-streets and Queen-streets and Charles-streets, and so on. In the French capital no two streets have the same name, while honour is done to the memory, not only of great Frenchmen, but the famous men of all countries, by giving their names to thoroughfares. There is, let it be observed, more than one English name thus immortalised. It is true that in London, in the classic neighbourhood of dingy Drury-lane, some of the streets have been re-named, and the names of Macklin, Betterton, and Kemble have been kept alive after a fashion which is, after all, scarcely complimentary. Milton's revered name has been, singularly enough, given to the Grub-street of a literary past,—past, in more senses than one. In new suburbs fancy has, it is true, been a little freer, and famous names are to be met with in the wilds of greater London, though the susceptibilities of inhabitants are, it would seem, occasionally roused, as in the case, which will not be forgotten, of a thoroughfare in Putney named after the late Earl Beaconsfield. But it is within the boundaries of London proper that there remains so much to be done in re-naming the bewildering thoroughfares after some such logical fashion as our Parisian neighbours, who, however, none the less sometimes contrive to carry their logic to extremes when, for purely political reasons, they change the names of thoroughfares which have long been familiar to foreign visitors to the banks of the Seine. To find in the neighbourhood of the so-called Quartier de l'Europe streets bearing the names of the various European capitals,—the Rue d'Amsterdam, the Rue de Londres, &c.,—is essentially logical, and until some such logic (for the American system of numbers is out of the question) is introduced into our large metropolis, the most bewildering mistakes must continue to be made.

ON THE SCIENCE OF MECHANICS AS APPLIED TO THE FINE ARTS.

UNDER this title Mr. George Simonds, the sculptor, read, at the Civil and Mechanical Engineers' Society, on Wednesday evening, a paper of rather unusual interest, as an artist's statement of the details of the mechanical side of his art. After some preliminary remarks on the general subject of the relation between mechanical and artistic power, Mr. Simonds proceeded by first drawing attention to the remarkable practical problem presented by the execution of the colossal statues of Egypt, works on such a scale and in such hard materials that numbers must have been employed on them at once:—

The erection of pyramids and obelisks by a people who had neither steam power nor hydraulic machinery at their command excites our just admiration; but although it argues a certain mechanical knowledge, it does not prove an acquaintance with more than the simplest mechanical appliances set in motion by a boundless supply of brute force. I do not, therefore, insist on these works, wonderful as they are, as showing any great influence of mechanical science upon art; but with Egyptian sculpture the case is different, and I would submit that without mathematical and mechanical knowledge of a high order it would have been quite impossible for any people to have erected such colossal works as the Sphinx, the Memnon, and many others. The methods employed by them for working the hardest and most intractable materials have been, and to a great extent are still, matters of conjecture, although it has recently been discovered that for certain purposes they made use of a tool in its action exactly resembling a modern diamond rock drill. To me, however, it seems less wonderful that they should have been able to master the hard material, than that they should have succeeded in giving pleasing expression and accurate proportions to works of such vast size. It is evident that they must have been hewn out by the united action of many men working at once; no one man could have achieved such a task. There must, therefore, have been a design for them to work to. And to produce a satisfactory result mathematical principles must have been skilfully applied to the enlargement of the small model.

In the British Museum there is a small stone lion, of Egyptian origin, marked over with lines intersecting each other at various angles, which, I think, was in all probability a small model from which to construct a similar lion of much greater dimensions.

The art of Egypt probably derived, for a time at least, great benefit from the rules and restrictions imposed on it by the priesthood; nevertheless, the system must have had its drawbacks, for if it prevented extravagance and absurdity, it also effectually precluded progress even of a legitimate kind. The same observations apply with equal force to Assyrian art, from which, but for such restrictions, as great results might have been expected as were afterwards obtained in Greece.

With the Greeks the case was, of course, very different. It is true that they derived their knowledge of the arts and sciences from Egypt, but they had not the same religion, and not being governed by a priesthood, they had no reason for observing the rules and traditions of Egyptian art for one moment longer than they found it convenient to do so. Thus we find that even in the early days of Greek art, when its character is quite archaic, the figures are full of movement and energy, and before long the faces only seemed to retain traces of Egyptian influence; as, for instance, in the Ægina marbles now in the museum at Munich, which, although carved only about forty years before the time of Pheidias, when Greek art suddenly rose to its highest, nevertheless in some little peculiarities of form and feature show their Egyptian descent.

Amongst the Greeks about this time art and science seem to have made most rapid progress, and sculpture and architecture must have received great assistance from the schools of Euclid and other mathematicians of that day, whose teaching would be invaluable to an artist in assisting him to understand the laws governing the constructive movements and balance of so complicated a piece of mechanism as the human form; and it needs, I think, little argument to show that, other things being equal, the man who will make the best machine drawing is he who best understands the machine it represents. So it is with the representation of the human figure, more especially in sculpture, for in painting colour and chiaroscuro are like charity, which often covers a multitude of sins. In sculpture, however, colour cannot be made to gloss over faulty and unmechanical construction, and, though many sculptors at the present day, of the so-called naturalistic school, endeavour to give an air of reality to their works by imitating the texture of the skin and other minute details, they often grossly neglect the correct mechanical construction of their figures, so that, even if they were suddenly to come to life, they could not move, their machinery being ill-designed and badly-fitted, even though, to the unmechanical eye, it may look well enough and very highly finished.

Construction, movement, and balance,—the three great points to be observed in the artistic representation of living forms, are all dependent on definite mechanical laws; and we have abundant proof that the Greeks were quite alive to this fact, and closely studied the laws that led, in their case, to such brilliant results.

Unfortunately, but little has come down to us of the formulæ they used. Something, however, we have; not much, indeed, but just enough to show us how much we have lost. I refer to the norma or canon set forth by the sculptor Polycletes, a very defective account of which has been handed down to us by Vitruvius, who himself does not seem to have been very clear about it.

In the early part of the Christian era art and science both fell to a very low ebb. Art, indeed, was so poor, that when the Romans wished to build a triumphal arch in honour of Constantine, they were obliged to despoil other pre-existing monuments in order to adorn the arch with sculptures which they had not the skill to execute themselves.

It was not until the revival of art and science in the Middle Ages that we have anything of note to record; but in the fourteenth and succeeding centuries we are met with a multitude of names of highest fame. In those days we find men who were, like Leonardo da Vinci, engineers, both civil and mechanical, as well as sculptors, painters, architects, and who yet found time for the study of poetry, music, and astronomy.

Previously to this great revival the mechanical processes of art had been utterly lost; and even at the present day we know but little of the systems whereby the ancients produced their masterpieces. Curiously enough, we have but few unfinished works of antiquity, and these few throw very little light on the system of measurement they employed. We know, indeed, from the many works in terra-cotta that have survived that they were skilful modellers, and we know also that they were acquainted with the properties of plaster of Paris, as it is commonly called, and that they were skilful moulders, but we do not know how they reproduced in marble the forms they had designed in plastic material,—we do not know whether they were in the habit of making full-sized models of their statues and copying them in marble, or whether they usually made small sketches in clay or plaster, and enlarged from these. As far as their tools are concerned, we know from the marks that they have left that they were almost identical with those that are in use to-day. They used a point tool for roughing down, which was simply a piece of rod drawn down to a square point, with which they wedged off lumps of marble with a hammer. Having reduced the block to a rough shape, they then bought it still nearer to size with a flat chisel, the edge of which was serrated; and the work was finished with ordinary chisels of various sizes, and with rasps. All these tools were doubtless precisely the same as those used in the Middle Ages and at the present day. They also used a drill for removing marble in the under-cutting of draperies, and in other parts where it would have been difficult or dangerous to use the hammer and chisel. There is nothing to show how the motive power was applied to these drills, but there is at least a probability that it was a reciprocating motion produced by a cord wound round the shaft of the drill, and kept tight by a bow, and worked by the carver himself; or else the two ends of the cord may

have been worked by an assistant, whilst the carver guided the drill. This latter is the method usually employed in Italy at the present day, as it leaves more freedom to the carver than when the bow is used. Having both hands at liberty, the carver can use his drill as a slotting-tool, cutting curves as easily as straight lines. I have, however, never seen any evidence that the ancients were in the habit of so using this tool; on the contrary, wherever I have seen the drill marks, they have been clear, distinctly separate marks, with no indication whatever of a side traverse.

In the Middle Ages they do not seem at first to have had any very clear system either of proportion or of measurement, and the mechanism of the human figure was very imperfectly understood. As a natural consequence the figures produced at that time were grotesque, not to say incorrect, in action, poor in form, and bad in their proportions. As, however, the laws of mechanics were more studied, and the art of construction was so well understood that it became possible to erect such structures as the bell-tower of Giotto, and later Brunelleschi's dome, the art of sculpture made corresponding strides. The discovery of fragments of antique art gave an impetus to the study of the beautiful, and the proportions of the figure were reduced to a truer standard; whilst the study of anatomy, although not permitted, was ardently practised by some few artists, and resulted in correct mechanical construction and harmonious movement. The parade of anatomical knowledge has often been made a reproach to Michelangelo by those who were too ignorant to understand him; and, indeed, to a superficial observer there would seem to be some reason for censure. Yet there is not one of his figures that is not full of life and energy. The carving is often very rough; the figures are rarely, if ever, finished in all parts; but one feels that the mechanical construction of the figure is correct. It may be exaggerated, the man may be a man of forty horse-power, but nevertheless he is a man with the limbs and joints of a man,—correctly articulated, with possible, not impossible, muscles and tendons,—muscles which need only the vital spark to contract and set the limbs in motion. These figures possess, in an eminent degree, that highest of artistic qualities, potentiality of motion.

The accounts we have of Michelangelo's method of working are not so ample as we could desire. We have, however, a diagram from his own hand for calculating the proportions of the human figure, and we have in the writings of Benvenuto Cellini, who was himself acquainted with the great master, what professes to be an account of his system. We have also a vast number of small models and studies in wax and in terra-cotta for large statues, but we have no full-sized models; from which we may, I think, conclude that he made small-sized models when the work was to be executed in marble, and full-sized ones only when it was to be cast in bronze; when, as the *cire perdue*, or lost wax system of casting, was the one he employed, the model would be destroyed in the process. According to Cellini his plan was to sketch with charcoal on one side of the block the outline of the figure he wished to carve, and that then he at once attacked the block, and, working always from the same side, produced the figure first as a low relief, then in ever-increasing relief, until it stood out freely in the round. To any one who knows the practical difficulties of sculpture this sounds very wonderful, and, although I am far from saying that it is impossible, yet, knowing Cellini's love for the marvellous and his hero-worship of Michelangelo, I am inclined to take this account with some reservation. That Michelangelo could carve a statue without mechanical aids I will not dispute, but that he should have found it convenient to do so is impossible. A scale for proportional measurement was invented by him for the use of sculptors, and is still the most convenient known and the most simple.

The system of measurement which has been general in Italy for a vast number of years, though there is no record of when it was first used, is a system of triangulation. A model is produced of the same size as the proposed statue in marble. On this model three principal points are determined: two on the base as far apart as possible, and one as near the top of the statue as practicable. A sort of T-square of wood is then constructed, which has a steel point at at the end of each of its three arms, and is of such proportions that the steel points rest each on one of the three principal points on the model. This T-square is then transferred to the block of marble, and the three principal points are assumed where the three steel points rest on the block. It is obvious that with this arrangement any point on the model can be easily obtained on the marble by the use of ordinary compasses; for if we measure the distance of the required point from each of the three principal points on the model, and also measure the depth in, from a point assumed on the T-square, and transfer these measurements to the marble, we shall be able, by carefully cutting away the marble and repeated trials, to find with extreme accuracy a point which will coincide with all the four measurements, and which is the the point required. In this way point after point can be found all over the figure, and a replica in marble of the original model is produced with mathematical accuracy. The introduction of this system was obviously of the highest importance to art, as it enabled the artist to depute to his assistants the roughing out and preparing of the work in marble, thus economising his own time and labour. This system, however, perfect as it is in the hands of careful and skilful workmen, is not altogether without drawbacks. Mistakes may arise from a careless workman taking one pair of compasses for another, or from want of accuracy in measuring from point to point; also there is a great loss of time from the fact that each point requires at least three measures to be taken. To obviate this inconvenience, what is known as the scale stone instrument, was invented, I believe, in England, where alone it obtained any considerable use. The instrument consisted of two blocks of stone, one, and sometimes more, sides of which were squared up true with the surface. An iron bar, formed like a strap, passed horizontally along the trued-up side. Between this strap and the side fitted an upright, held in place by a wedge. An arm moving on a universal joint was fastened to this upright, sliding up and down it on a sleeve. At the extreme end of this arm was another universal joint, with a short arm bearing a pointer or needle. All these joints could be clamped immovably. The model being fixed on the one scale stone, and the block of marble on the other, the upright was now placed in the strap and tightened up by the wedge. The arms were now moved until the pointer rested entirely on the point to be transferred to the marble; all the joints were then clamped up, except the needle, which had a little stop put on it, and was then withdrawn, it being fitted in a slide. The wedge was then loosened and the instrument transferred to the other scale stone,—wedged up, and the pointer slidden forward,—the marble being cut away to allow its motion until it came against the stop, its point touching the marble at the same time indicated the exact point required. This instrument had many good qualities, but the use of scale stones was highly inconvenient, and, although it was popular in England, the foreign artists would not use it, as they found that the saving of time was more than counterbalanced by the inconvenience of being unable to move the work; and, moreover, they accused the instrument of being inaccurate.*

PROFESSOR NEWTON'S LECTURES ON MONUMENTS OF LYCIAN ART.

THE first of Professor Newton's course on Lycian art was delivered at University College on the 4th inst., and contained a description of the physical features of Lycia and a sketch of its history up to the time when it was merged into the Roman Empire. Lycia may be called an ancient Switzerland; but it was a Switzerland with a seaboard. Intersected by mountains, the height of which ranged from 20,000 ft. to 6,000 ft., with fertile plateaus and valleys at rare intervals, and with excellent harbours along the coast, Lycia was a country of which the conformation favoured the distribution of the population into autonomous districts something like Swiss cantons. These were united in one common confederacy, called the Lycian League, the constitution of which formed the subject of a special treatise by Aristotle, now unfortunately lost.

The first notice we have of the Lycians is in Homer, where the heroes, Glaucus and Sarpedon, appear as allies of the Trojans, where we have notice of the myth of Bellerophon and of the Solymi, a Semitic race, who appear to have been driven into the mountains which form the Eastern boundary of Lycia by the Tremilæ, an Aryan race, who gradually became mixed with Greek settlers on the coast. After this fusion of the Tremilæ and Greeks had taken place, Lycia was conquered by Cyrus B.C. 540, and appears to have remained more or less under Persian dominion till the time of Alexander the Great, after whose death it passed into the possession of the first Ptolemies, and, after various vicissitudes, finally became part of the Roman Empire, being allowed, however, to retain the organisation of its League, with diminished powers, till the time of the Emperor Titus, by whom the confederacy was finally abolished.

In his second lecture, on the 11th inst., Professor Newton noticed at the outset the various travellers to whom our present knowledge of Lycia is due, and whose explorations commence at the beginning of this century, when Sir F. Beaufort first laid down the correct outline of the coast. To Sir E. Fellows was due the merit of having discovered the city of Xanthos in 1838, and it is mainly to his exertions that we owe the remarkable set of Lycian sculptures now in the British Museum. The lecturer then described the more ancient of these sculptures which are to be found in the Archaic Room at the British Museum. Of these the most remarkable are the reliefs from the so-called Harpy Tomb, the original form of which was a square pillar, with a small chamber at the top surmounted by a cap-stone, the whole being about 20 ft. in height.

In form this monument closely resembled the tomb of Cyrus, as described by Strabo. The reliefs which decorated the four sides of this tomb were all undoubtedly funereal. At two of the four corners were Harpies, the symbol of sudden death, carrying off diminutive draped figures, probably representing souls; on the west front there were two seated female figures, perhaps Demeter and Persephone; on the opposite side, a warrior offering his helmet to a male seated figure; and on the north and south sides respectively, a group of a seated figure receiving other offerings. The lecturer then examined the rival schemes of interpretation which have been proposed in reference to these reliefs by Brunn, Curtius, and others. Not one of these schemes has commanded the general assent of archæologists. He then made some critical remarks on the style of the monument, the date of which probably ranges from B.C. 520 to 500, though it may possibly be earlier.

THE WALSHAM MEMORIAL TOWER, ALL SAINTS' CHURCH, MARGARET STREET, HULL.

THIS church is beyond doubt the finest, architecturally considered, of any modern church in Hull; designed by the late Mr. G. E. Street, R.A., and carried out in his characteristic style.

The design for the tower was submitted in a limited local competition by Mr. Samuel Musgrave, architect, of Hull. The tower was intended as a memorial of the late Canon Walsham, M.A., the first Vicar of the church, who died in 1882. The style and detail of the church are strictly followed in the design for the tower, and it was proposed to be erected in local brickwork and Ancaster stone.

Building on the "Mulberries" Estate at Camberwell.—The old estate at the beginning of Coldharbour-lane, Camberwell, known as the "Mulberries," is about to be laid out for building purposes, and on Tuesday the building materials of the mansion, out-buildings, and grounds were sold. The estate covers an area of about 10 acres, upon which it is intended to erect upwards of one hundred houses, together with a number of shops. In addition to the materials of the mansion and various buildings, the sale included the whole of the growing timber on the estate. A portion of the estate has been disposed of to the London School Board, who are erecting a school on the site.

* The remainder in our next.

CHURCH OF ALL SAINTS HULL

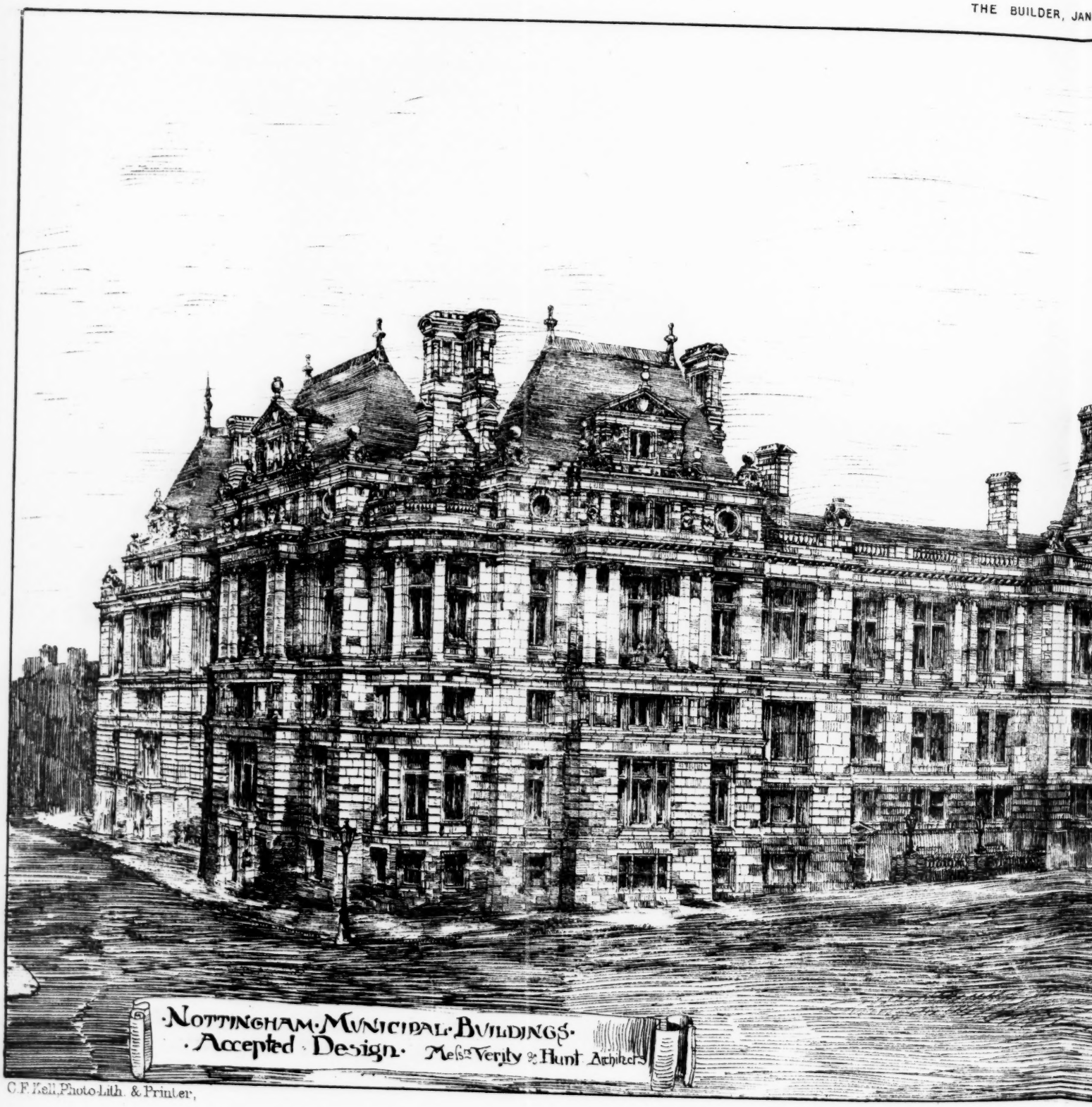
THE LATE GEO EDMUND STREET, R.A. ARCHITECT.

DESIGN FOR THE PROPOSED "WALSHAM MEMORIAL" TOWER

SAMUEL MUSGRAVE, A.R.I.B.A. ARCHITECT, HULL.

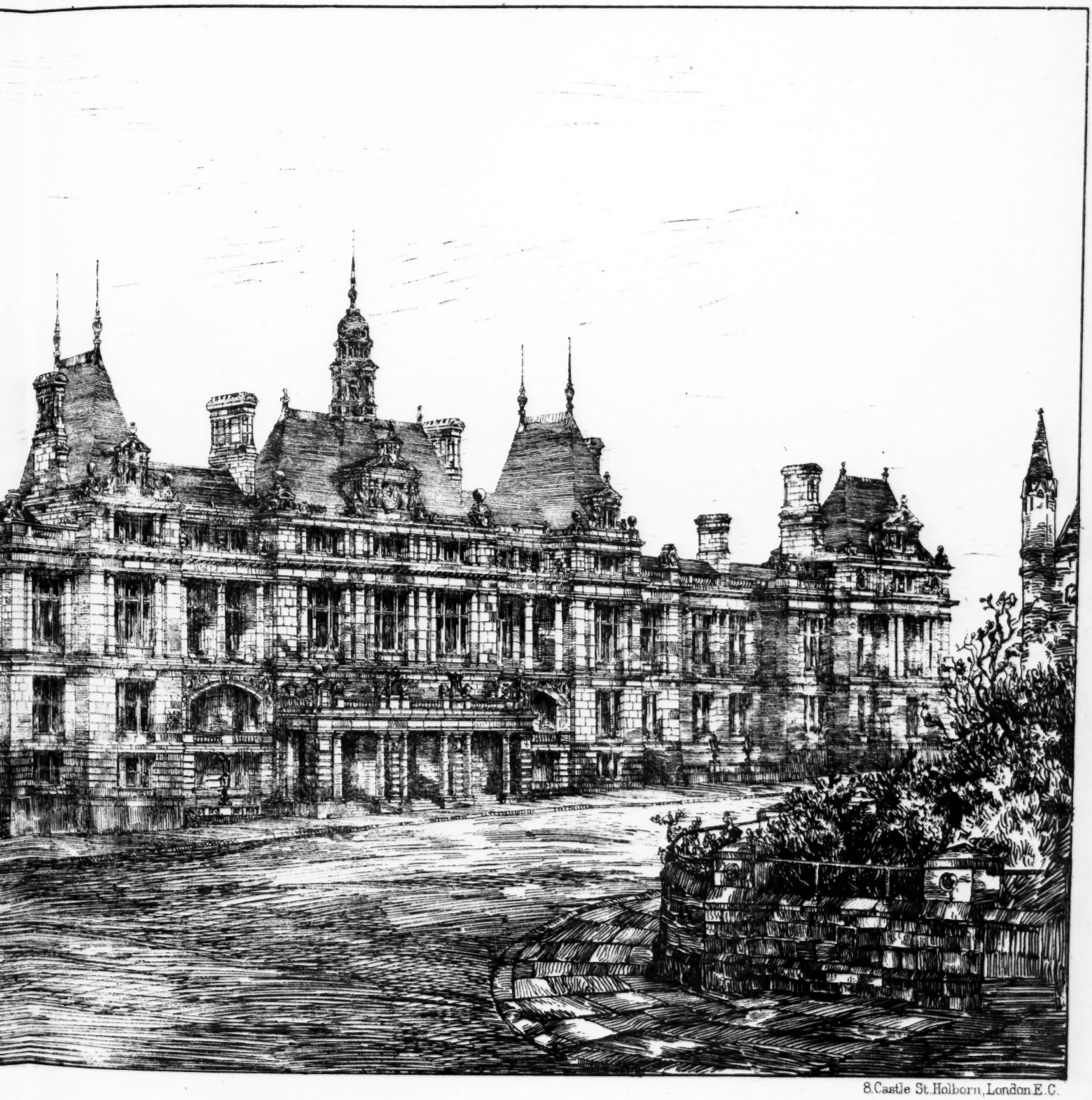
Wyman & Sons, Photo-Litho

C^t Queen S^t London, W.C



NOTTINGHAM·MUNICIPAL·BUILDINGS·
·Accepted Design· Messrs Verity & Hunt Architects

C.F. Kell, Photo-Lith. & Printer,



8.Castle St.Holborn, London E.C.

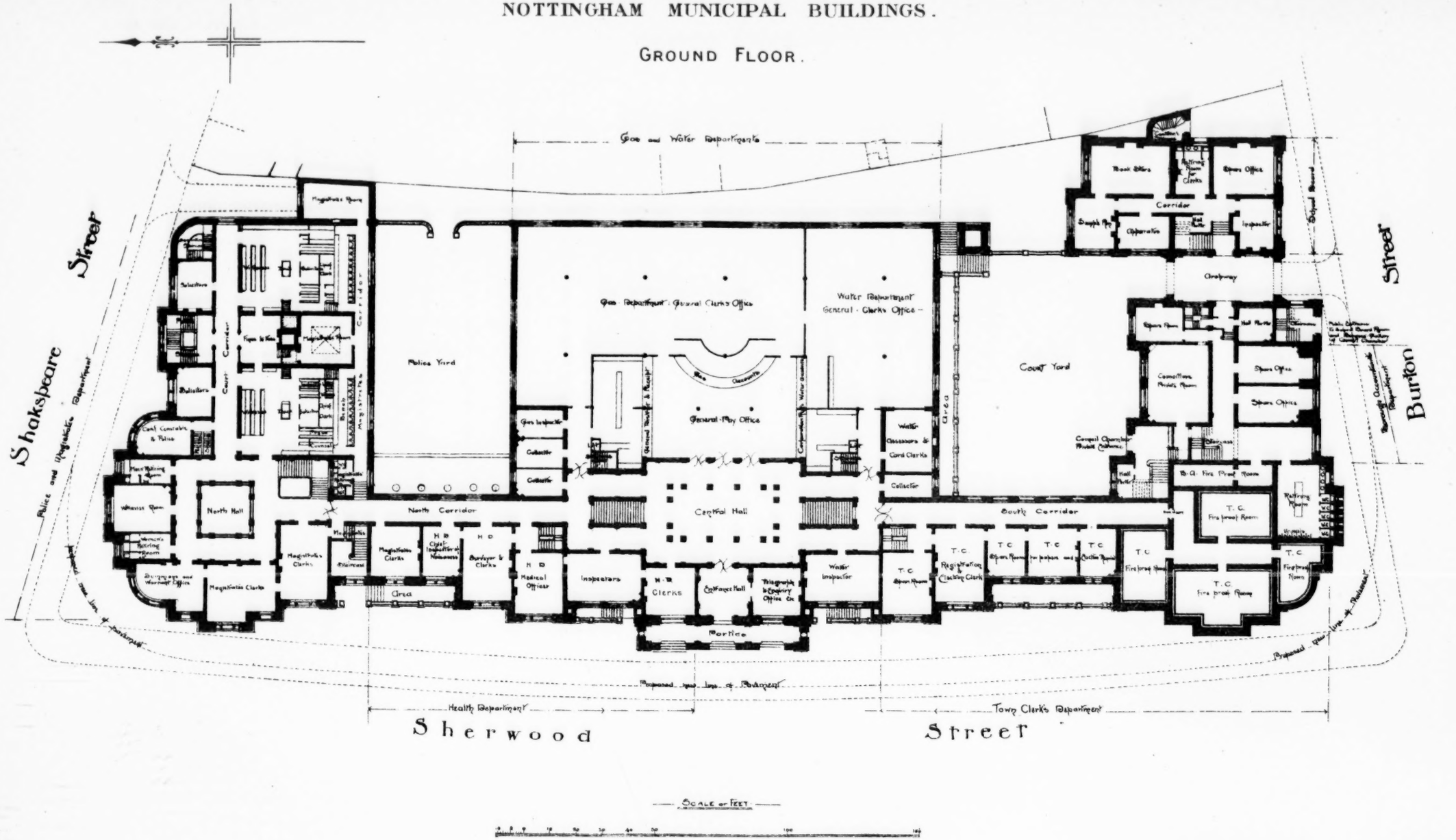
Whiteman & Bass, *Photo-Litho* 236, High Holborn.

Wyman & Sons, Printers, Gt Queen St.

THE RATHHAUS, MARKT-BREIT, BAVARIA.

NOTTINGHAM MUNICIPAL BUILDINGS.

GROUND FLOOR.



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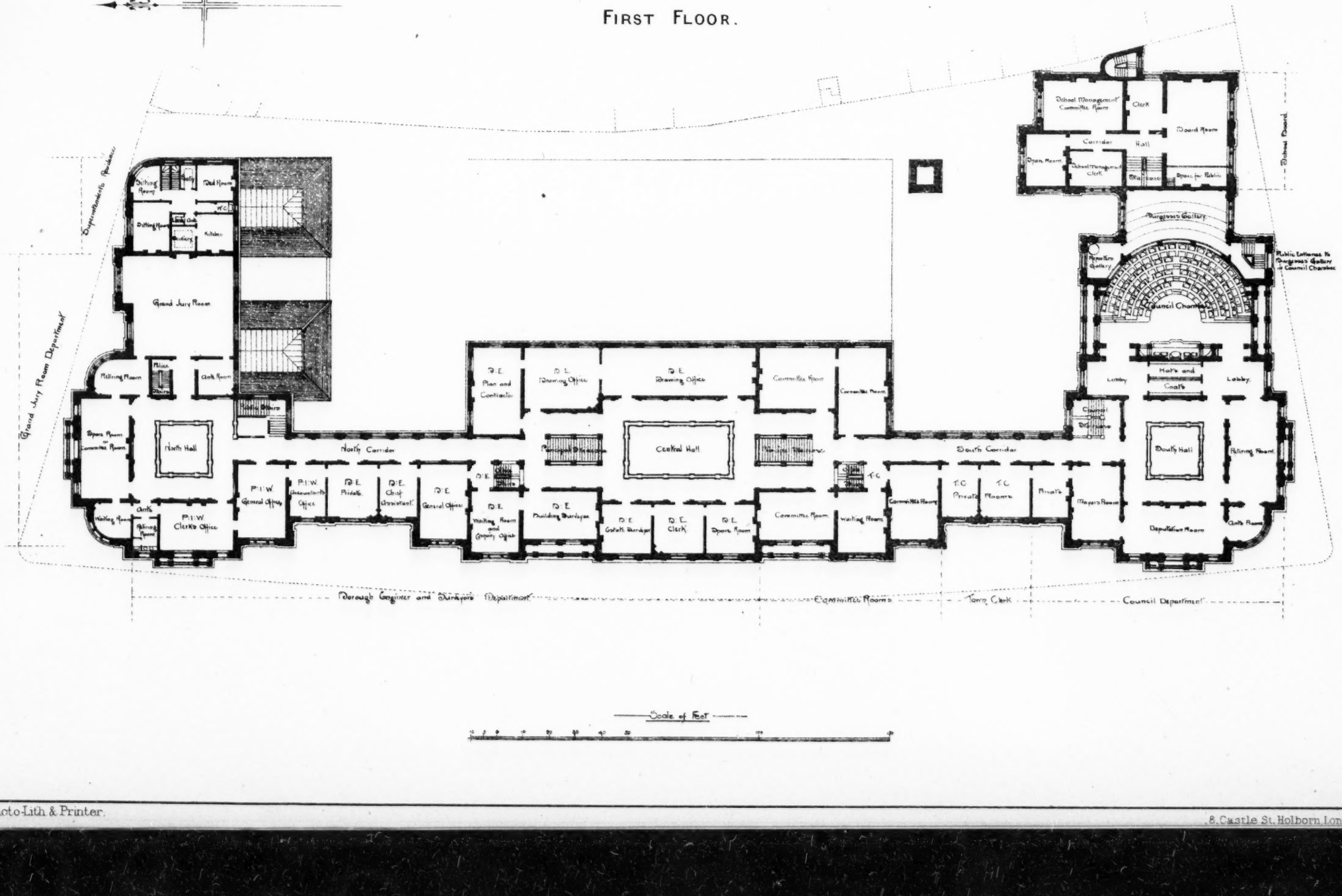
8, Castle St. Holborn, London. E.C.

NOTTINGHAM MUNICIPAL BUILDINGS.

First Floor.



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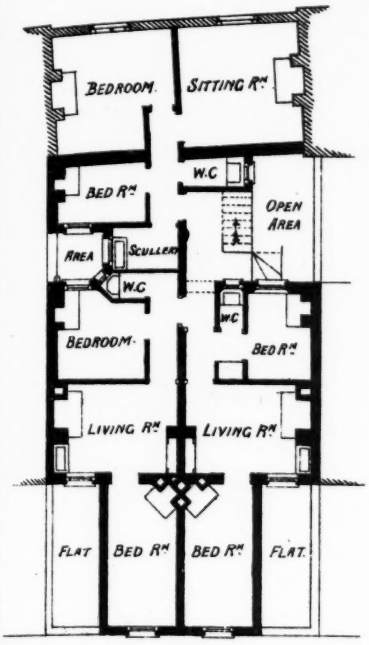
New Premises in Uxbridge St. Notting Hill

MR. ARTHUR YOUNG, ARCHITECT.



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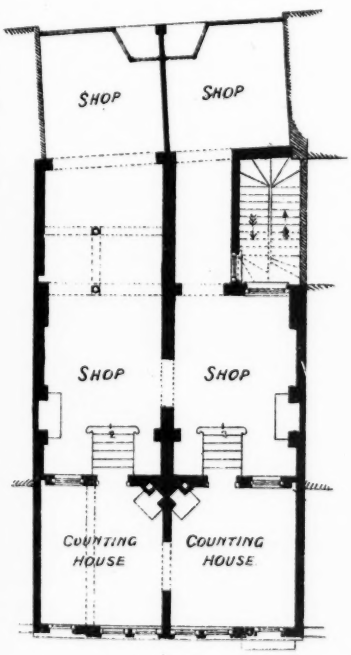

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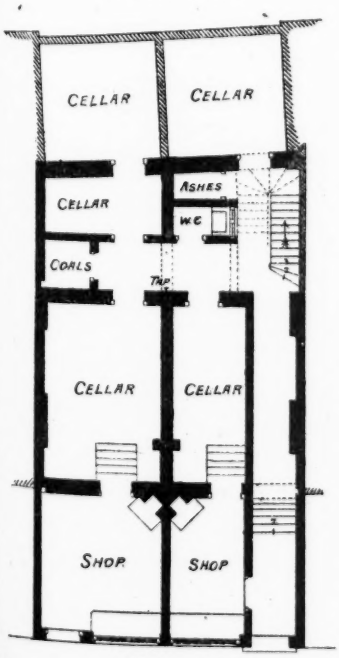
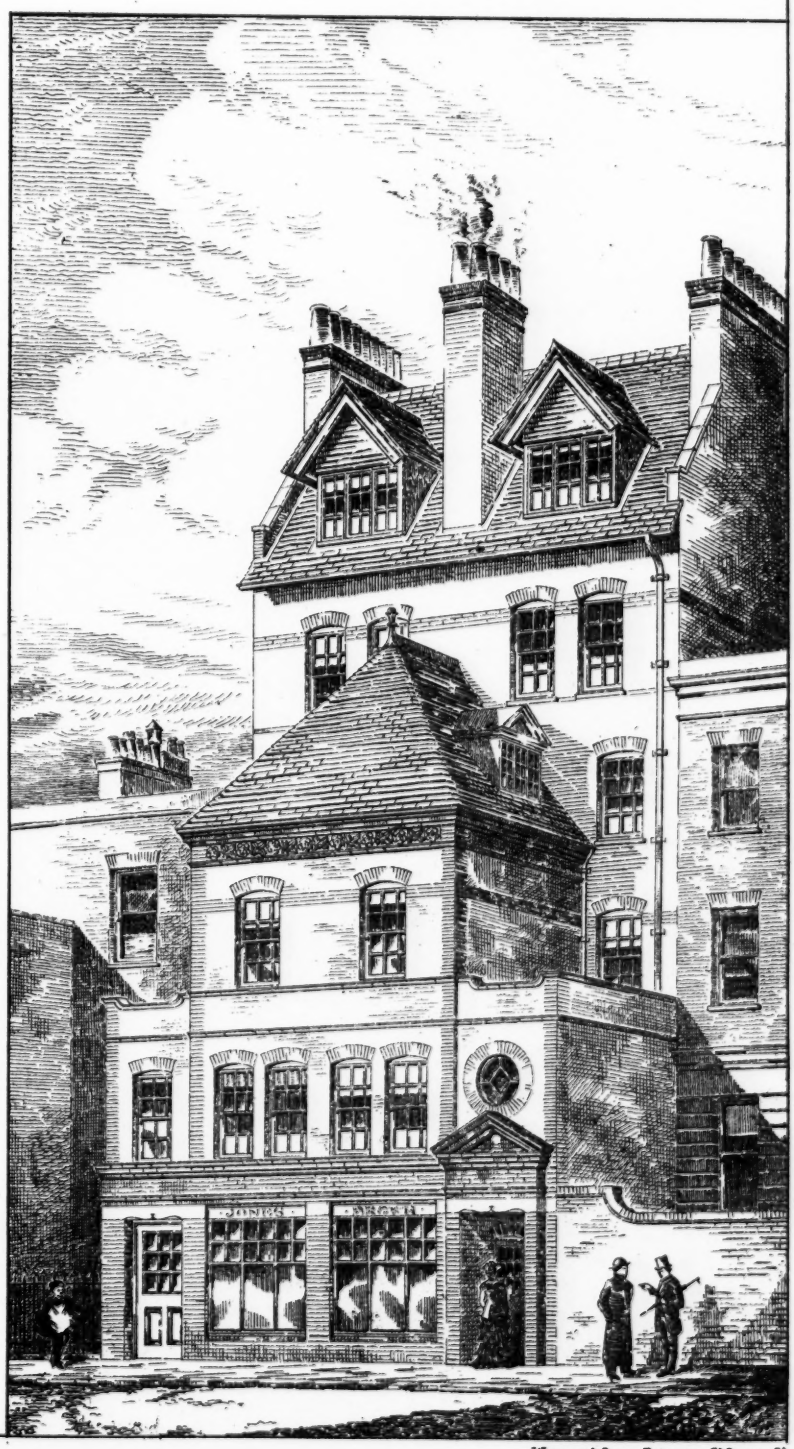


BASEMENT.



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NOTTINGHAM MUNICIPAL BUILDINGS.

WE publish this week a perspective view of the accepted design for this important building, by Messrs. Verity & Hunt. As will be remembered, the design was selected from among those of seven architects who were invited to compete finally, having been selected from the sketch designs submitted in a preliminary competition. Eight architects were invited to send in, but only seven accepted the invitation. Mr. Waterhouse was the professional assessor, and he bracketed the design of Messrs. Verity & Hunt with that of Mr. Oldham, the former being recommended for plan, the latter for picturesque quality of design. The Corporation of Nottingham rightly considered that plan was the most important element, and also expressed the opinion that the design of Messrs. Verity & Hunt was best adapted for the purposes of the proposed building; an opinion from which we are not disposed to dissent, though estimating highly some of the original and picturesque treatment in Mr. Oldham's perspective view. These two designs being bracketed and the premiums divided, the third premium was awarded to the design by Mr. Corson, which also we propose to illustrate shortly.

The estimated cost of the building is 141,257*l.*, with a probable further outlay of about 20,000*l.* for lighting and furnishing.

THE RATHHAUS, MARKT-BREIT.

WE have frequently had occasion to allude to the peculiarity of the sites selected for churches and public buildings by the Mediæval architects of Germany. They seem never to have been daunted by any difficulty, least of all by want of space. If there was no room for the proposed building upon the ground, they built it over the water or up in the air. The Rathhaus at Markt-breit is a remarkable case in point. As this busy little commercial town rose in importance and size, a new and larger Rathhaus or townhall was required, but as the town was already closely built with rather narrow streets and high houses, no site was available for the purpose. The modern idea of clearing a site by pulling down a number of houses and turning the inhabitants adrift was not to the taste of Mediæval corporations, and, of course, such an important edifice as the Rathhaus could not possibly be erected outside the walls of the town. Now the way the difficulty was met was most ingenious. The building was constructed partly over a river, which runs through the town, and partly over the principal street, and thus a townhall of sufficient size and importance was obtained without the sacrifice of existing buildings, and absolutely without any site at all!

The Rathhaus at Markt-breit dates chiefly from the earlier part of the sixteenth century, but great alterations were made at the commencement of the seventeenth century, to which date the elaborate gables may be ascribed.

H. W. B.

NEW PREMISES, UXBRIDGE-STREET, NOTTING-HILL.

THE view and plans which we give of these simple and unpretending buildings will speak for themselves. Nothing could well be more simple, but they have the merit of being suitable to their purpose and being substantially and solidly built, and without any of those gimcracks of wooden cornices and such adornments which characterise the average shop-front architecture. The architect is Mr. Arthur Young.

London and Middlesex Archæological Society.—At a meeting of this Society at 4, St. Martin's-place, Trafalgar-square, last Monday evening (14th inst.), a paper was read by Prof. John W. Hales, M.A., "On the Barrow at Hampstead Heath, with Notes on Traitor's Hill"; after which another paper by Mr. John Sachs was read "On the Foundations of Ancient Buildings recently discovered in Chancery-lane." The lower foundations formed portion of the old temple. Mr. Alfred White, F.S.A., remarked that at the removal of Middle-row some years back considerable remains of foundations were discovered, and were quite understood to belong to the old Temple.

FOUNTAINS ABBEY.*

IN addition to the extreme simplicity of form in the plan and elevations of the church, we find that the interior decoration of the building was equally simple. It so happens at Fountains Abbey that, notwithstanding more than three hundred years of exposure to all the inclemency of a Yorkshire climate, much of the mural decoration of the church still exists: it is of the plainest description,—merely red joint lines on a white ground. With these red lines the whole surface of the walls, piers, and arches seems to have been covered, and it is interesting to note that some of this jointing belongs evidently to the twelfth century, while some of it must have been done quite 300 years later, showing that the ancient rule in the matter of painting did exercise considerable repression even to the last days of the order. In the whole Abbey of Fountains I only discovered the remains of one small fresco. It is on one of the piers on the south side of the nave, and probably formed part of an altar-piece. It appears to have been executed in monochrome.

At the west end of Cistercian churches there is often found a portico, or narthex, extending along the whole length of the western façade. Its primary use is doubtful, but it was used at Fountains, and I do not doubt elsewhere also, as a place of sepulture; I should think very likely for noble personages of the laity wishing to be buried near the church, within which the strict laws of the order would not admit their bodies.

It may be well to mention here, as a termination to my remarks upon the church, that the Cistercians were among the first to make use of the pointed arch, and it is particularly worthy of note that they used it first, not for the more decorative features, such as windows, doors, and arcadings, but, without exception, for the main arches of construction, such as arches of the nave arcade, the great arches at the crossing, and for the transverse ribs of vaulting. This seems to me to be a conclusive argument against the theory that the pointed arch was discovered by the chance intersection of two semicircular arches in Norman arcading. I believe, on the contrary, it was adopted on constructional motives,† from the recognition of the fact that a semicircular arch without a keystone is inclined to be weak, while with a keystone it necessitates a different mode of treatment from what our eleventh and twelfth century ancestors were willing to adopt.

I must now say a few words about the other main conventual buildings at Fountains Abbey, all of which are in a wonderful state of preservation. On leaving the church by the cloister door and walking south, we first come to what now looks like a vaulted passage. This was originally divided into two separate apartments, of which the eastern one was the sacristy, with a private entrance into the south transept of the church; and the western one seems likely to have been a cell in which the monks may, perhaps, have expiated their minor offences. In after years it came to be used as a charnel-house, and no less than 500 nearly perfect skeletons were found carefully packed in this small space when the ruins were first put in order, some thirty years ago. Next comes the chapter-house, which, like most chapter-houses of this order, is a long parallelogram, divided into three aisles by two rows of pillars running from east to west. This was a very elaborate piece of architecture; it was vaulted throughout with rich stone vaulting, supported on corbels against the walls and the columns before named. These latter, with their caps and bases, were of polished marble. The chapter-house was entered by three great archways leading directly into it from the cloister, and as these archways never had doors, and the cloister was not glazed, the chapter-house was virtually open to the outer air. The memorial slabs of several of the abbots remain in the chapter-house, and also the bases of three tiers of stone seats running round the walls. As the remains of these seats are interrupted at the east end of the centre aisle, I am inclined to think that the abbot's chair stood in this position, and was of wood.

Next to the chapter-house is a richly-vaulted passage, which leads directly to the abbot's house and various other buildings to the south-east of the central block, of which I have not time to speak.

* From a paper by Mr. J. Arthur Reeve, read at the Architectural Association. See p. 75, *ante*.

† As was fully shown by Mr. Sharpe in his splendidly illustrated "Parallels," published *Consule Planco*.—ED.

Then follows the fratry, a long, low, and inexpressibly dismal building, running north and south. The northernmost bay, which overlaps the cloister, was divided off from the rest of the apartment, and had a doorway at each end, one communicating with the cloister court, and the other with the base court. The part thus cut off from the monks' day-room may perhaps have been a locutorium. The wall which originally separated this apartment from the fratry is now demolished, but it is plain that it once existed. At Fountains this locutorium was evidently an after-thought; but it generally forms one of the separate rooms in a Cistercian abbey. Sometimes this and the passage mentioned above are transposed, but traces of both are almost always found. The fratry itself is a low, vaulted room, divided into two aisles by a row of columns down the centre. It was lighted, or, rather, its extreme gloominess was made manifest, by two windows at the south end. There was no other natural light, but possibly lamps were kept burning at the northern end of the apartment. Above this day-room was the monks' dormitory which was reached by a flight of stairs, still existing, betwen the fratry and the kitchen. From this dormitory there was a passage leading directly into the south transept of the church, which enabled the monks to attend the midnight services with greater ease. The scriptorium also was reached by this passage. It was situated above the four eastern bays of the chapter-house, and must have been a very spacious apartment; but now only the three outer walls remain, and these are in a very ruinous condition. The height of the roof over all of these buildings is given by the line cut in the face of the south transept to receive the flashing. Strangely enough, although the chapter-house and fratry are only two or three years later in date than the nave and transept of the church, and must have formed part of the original design, this roof-line was allowed to cut, in the most careless manner, across the windows of the transept.

We now reach the buildings on the south side of the cloister court, of which the kitchen comes first. This is a very fine, lofty room, oblong in shape, vaulted, and divided into two bays each way, with a massive pier supporting the ribs in the centre. In the eastern wall there are two great fire-places, the openings occupying the whole width of one bay each; they are more than 16 ft. wide, by 6 ft. 6 in. high, and are square-headed, the lintels being formed by flat arches composed of goggled stones, 4 ft. 9 in. deep. The kitchen was lighted by two large windows in the south wall, and there was also a doorway in this wall giving access to certain buildings lying between the fratry and refectory, which were, probably, sculleries, fuel houses, &c. In the west wall of the kitchen are two openings, cut after the completion of the building, to form hatchways into the refectory; in the north wall there is only the doorway leading into the cloister court.

In the centre of the south wall of the cloister stands the noblest of all the conventual buildings, namely, the refectory. This must have been a superb room when in a perfect state; it is 109 ft. long by 46 ft. wide, and is divided into two aisles by a row of marble columns down the centre. Unlike all the other buildings in the Abbey, this room was not vaulted; it seems to have had two parallel wooden ceilings, arched in form and very lofty. The seats and tables were arranged round the east, south, and west walls of the building, there being, apparently, a somewhat higher table along the south end than elsewhere. The seats were of stone and the tables had stone uprights, but, no doubt, the flat part of the table was of wood. The remains of these stone fittings exist in a sufficiently perfect condition to enable one to restore the interior of the refectory with a very considerable amount of accuracy. The pulpit, which, I believe, is almost invariably found in the refectory of a large abbey, is clearly traceable at Fountains, on the west side of the building; the doorway and flight of stairs leading to it in the thickness of the wall are quite perfect, and just inside the doorway is the locker in which the books were kept. Quite at the north end of the west wall there is a doorway with curved sides, leading into the buttery. This is very interesting as showing that here stood a turntable from which, no doubt, each monk took his rations as he entered the refectory.

The buttery is the last building on the south side of the cloister, and of this there is little to be said beyond what I have just mentioned concerning the turntable. Owing to various alterations which have been made in it from time to time it is a most puzzling ruin to decipher, and one which hardly repays one for the trouble it gives. The only point of real interest about it which remains to be noted is that part of a stone sink exists in it to which a considerable length of lead-piping is still attached. I must not omit to mention that there are the remains of the lavatory along this south wall of the cloister, on each side of the refectory doorway; its form is a long trough, one half of the whole length of which still remains. It is evident by the deposit of lime still adhering to it that this trough was always kept full of water. The holes for the serving-pipes and waste-pipes are in existence. There is a ledge running all along behind the trough, upon which, in all probability, small brass reservoirs with taps were placed, for our forefathers were in the habit of washing their hands *over* a basin rather than *in* it.

The last building to be mentioned is the "Domus Conversorum." I think there can be very little doubt that Mr. Sharpe was right when he came to the conclusion that the long low building which is generally found on the western side of the cloister-court in Cistercian abbeys was the house inhabited by the *conversi*.* In design, it follows very much the lines of the fratry; that is to say, it consists of a long low vaulted day-room below, with a large dormitory above; but as the number of *conversi* was very much greater than that of the monks, their house is very much larger. At Fountains it is no less than 300 ft. long by 41 ft. wide; it was probably originally divided into at least two parts, although there is now no sign of a partition; at all events, the southern end, from the number and size of its windows, has evidently been used as a workshop, while the northern end was merely a kind of lobby in which those *conversi* mustered who went out of the Abbey to work in the fields, stables, &c. It is thought by some people, too, that the eastern aisle of this northern part was used as a store-house. For my part, I am inclined to think that, considering the immense number of *conversi*, the whole of the space is likely to have been wanted to accommodate them during the winter evenings after work was over. There are four large doorways in the western wall of this northern portion of the day-room, and two small ones, evidently to allow the crowd of *conversi* to get rapidly out of the house on leaving the church after attending the early service, at which they were all bound to be present. At the north end of the western aisle there is a large door leading directly into the south aisle of the church. On the western side of this great building, and about in the centre of it, there is a little room with a fire-place in it, over which are the steps leading to the dormitory. This room was inhabited no doubt by the Magister Conversorum, who was responsible for the good behaviour of this large body of servants,—for such they might almost be called. There is nothing much worthy of note in the dormitory itself; it is as large as the day-room below, and was lighted by narrow round-headed windows, throughout its length, on each side; a flight of steps at the northern end leads down to the south aisle of the church, showing that although the *conversi* did not attend the midnight services they went straight to the church from their beds before leaving the Abbey on their various daily duties. The dormitory was not vaulted; there were therefore no columns down the centre; it is even probable that there were no partitions; the long unbroken lines of sleeping *conversi* must therefore have presented a most strange, even weird, appearance to the eye of any one who could have seen them; they slept in their ordinary clothing without extra covering.

Of the other buildings connected with the Abbey besides those of which I have now given you a rough sketch, the chief are the abbot's house, the *hospitium*, with the infirmary, the gatehouse, and the mill, all of which still exist in a more or less perfect condition at Fountains; the mill is even yet in constant use.

In addition to these there are also many mounds and portions of decaying walls in the neighbourhood of the Abbey which no doubt mark the positions of stables, granaries, &c., the reservoirs and stew ponds are also in existence on the side of the hill to the south of the Abbey, and it is clear besides that the subject of drainage received their careful attention; the *necessaria* attached to the *domus conversorum* being still in a remarkable state of preservation, while a similar building for the use of the monks is clearly traceable to the east of the fratry; they are both built over the river, as were the other small garderobes attached to the *hospitium* and abbot's house; but although all of these remains are very instructive and picturesque on the spot, I fancy it would be even more difficult to make them interesting at a distance than those parts of the Abbey which I have touched upon to-night.

* This has been called in question since, not without reasons assigned. See some papers on "Benedictine and Cistercian Architecture," in the *Portfolio* last year.—ED.

In the course of the discussion, the chairman (Mr. Cole A. Adams, President) said that Fountains Abbey and other buildings of the Cistercian order were well worth the attentive study of young architects, for with comparatively few mouldings, and the severest rules as to decoration generally, the Cistercian architects succeeded in producing buildings of the grandest character.

Mr. F. T. Baggallay said he had been struck by what Mr. Reeve had said as to the influence of the lives led by the builders upon the buildings which they erected. If there were anything in that, it was to be regretted, if only for the sake of our architecture, that the lives of the people of the present day were so different from the simple, pure lives led by the Cistercian monks. The luxury of the present day was the cause of luxury and exuberant ornament in our buildings, and to it the decay of the Gothic revival was no doubt partially due.

Mr. Millard observed that Mr. Reeve had measured the whole of the buildings at Fountains in the most exact and minute manner, and he was, probably, the only man who could have given the Association so interesting a paper on Fountains Abbey.

Mr. A. B. Pite, Mr. Leonard Stokes, and Mr. Hampden W. Pratt each said a few words, Mr. Pratt asking whether the remains of the buildings were being kept up as "a ruin," or whether they were allowed to go still further to decay. He also asked whether it was contemplated to restore any of the buildings to their original condition. Mr. Reeve's conjectural restorations were very interesting, and were, no doubt, well warranted by facts within Mr. Reeve's knowledge.

A vote of thanks having been put and carried,

Mr. Reeve, in briefly replying, said he had been employed by Lord Ripon, the owner of the Abbey, to make the measured drawings, and his instructions were to make them as complete as possible, and it had, therefore, been his duty as well as his pleasure to do so. He could not say whether the ruin was being maintained or "kept up" now, but he presumed so. The late Mr. Burges was appointed by Lord Ripon as the architect charged with the preservation of the ruin, but he (Mr. Reeve) did not know whether any one had been appointed to fill Mr. Burges's place.

The Moisture of the Atmosphere.—The fifth of the course of lectures on "Meterology," by Mr. W. Marriott, F.R.M.S., was delivered on the evening of January 10, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. Charles Horsley, past-president, in the chair. The subject under consideration in this lecture was the moisture of the atmosphere. The air is a mixture of certain gases, the most important being oxygen, nitrogen, and aqueous vapour. These may be resolved into two classes, viz., an atmosphere of dry air, embracing oxygen and nitrogen, and an atmosphere of aqueous vapour. The dry air is always a gas, and its quantity is constant; but the aqueous vapour does not always remain in the gaseous state, and its quantity is ever varying through the processes of evaporation and condensation. The lecturer having described the methods employed for determining the amount of evaporation, and also the various hygrometers for ascertaining the amount of moisture in the air, and the deductions to be made from them, explained how dew, hoar-frost, mist, and fog are formed. The lecturer concluded by giving a description, with illustrations, of the various forms of cloud.

THE *QUARTERLY REVIEW* ON THE DWELLINGS OF THE POOR.

THE current number of the *Quarterly Review* devotes two dozen pages to a discussion of the all-absorbing question of the provision of decent homes for the poorer classes, and a reformation of the influences by which they are surrounded; and it is not difficult to see in the trenchant style, the caustic hits at political opponents, and the abundance of epigram with which the essay is enlivened, the traces of a well-known hand. In substance the article in question only echoes what we have ourselves proclaimed from the house-tops these twenty years. In manner it is disfigured by a polemical cast. Nothing will be gained by using so serious a subject as a fulcrum for discrediting a political opponent. And it will be unfortunate if the misery of the poor, and the squalor of their dwellings, should be dragged into the political arena, and become the battle-field of contending parties in the State. All are agreed as to the evils which have to be remedied, and agreed, too, that it is incumbent on some one to do something on a large scale to relieve the kingdom from the presence of an ugly blot. But what it were best to do is a matter upon which it is difficult to agree, and it is not to be hoped that a working solution of the problem will be arrived at by political philanthropists or philanthropic politicians, while one side greet the recommendations of the other with a cry of "socialism" and "confiscation," and while rival schemes are met with thinly-veiled accusations of extortion and robbery. There is a danger of the work remaining undone for want of knowing who should do it, and of narrowing the question of housing the poor to the respective duties of the State, and the land-owner. It is needless to say that in spite of evident and strenuous political bias, the writer in the *Quarterly* brings to his consideration of the question a large amount of carefully collected (and selected) knowledge, and a pre-conceived determination that, whoever is to blame for the shocking state of some quarters of our great towns, the freeholders are blameless. "It is untrue," he says, "that the landlords as a class are making or have been making a profit out of the wretchedness and overcrowding which exist on their property. By far the greater number of houses in the metropolis are let and sublet,—sometimes through five or six hands,—the landlord getting a moderate ground-rent settled probably long ago." And so on. But here the writer must have known that he was fencing with the real charge against many of the landlord class. What happens when the old lease which was based upon the old valuation falls in? Does the landlord as a rule set about readjusting his revenues on the principle of limiting the occupation of the property to a decent and healthy basis, and assessing the new rent for his property on the increased value of it if legitimately used? The gravamen of the charge against him is that he uses the necessities of the poor to swell his income, and shelters himself behind lessees as a means of disowning the attaching responsibility and odium. This is human nature and not a weakness chargeable upon any one class in particular, and while human nature remains unchanged this weakness will probably show itself, as it has always hitherto shown itself, until the end of the world. The State must check the growing evil, and, to check it, two things are requisite,—a vigilant unsleeping scrutiny, and power to arrest the incipient mischief.

One of the greatest hindrances to the improvement of the houses of the poor is the question of compensation to those interested in the property. However the owners may neglect their duties, the law secures them certain rights, and they cannot be dispossessed without fair compensation. What is a fair compensation to the owner of a house which is so deficient in all the qualities which should distinguish a house that the State is obliged to step in and say, "This must come down"? The statute says the compensation is to be based on the "fair market value" of the property. The market value of anything, say the owners, is what it will fetch, and the competition for these wretched dens, so miserably inadequate in number, loathsome as they are, is so keen that fancy rents are paid for them by their half-famished occupants. Shall the value of these be assessed on the rental, or how? The arbitrators under Cross's Acts, as they are called,

have laid down these salutary canons, which have received the approval of a special Parliamentary committee:—First, "A house *too bad for repair* [not an exacting definition] is not to be valued as a house at all; but as a plot of land with so many cart-loads of rubbish upon it." Secondly, "In valuing such a plot of land, regard is to be had to its evil surroundings."

When, however, the initial difficulties have been overcome and the site has been cleared the troubles are only commencing. Too many poor people, who were callous to the miseries with which their lives were visited, have been dispossessed only to make the congestion in the remaining tenements more severe, and no substitutes for the demolished dwellings have been erected. There are many suggestions for meeting the difficulty, but none of them are quite equal to the emergency. Lord Salisbury would have the State become a mortgagee for the purpose. Mr. Torrens would apply the Post-office Savings Bank balances to the work, lending the necessary sums to the Vestries at 2½ per cent. interest, and taking the rates as security. Attempts to make the erection of the necessary dwellings, with proper accommodation and a fair rental, pay, have failed hitherto. The money question is at the bottom of the whole, and the money question is an open one. Private speculation is not likely to undertake the work at a loss. The scope is beyond the efforts of philanthropy, and all are agreed that, with our present views on social ethics, the work is not for the State.

One thing the State can do. It can decree that certain conditions inimical to the public health and safety shall not be allowed to exist unpunished and increase unchecked. To this end the several Acts in force are theoretically competent. But they fail for want of being enforced. The law, if not perfect, is adequate to a reasonable and satisfactory amelioration of the dwellings of the poor, and the first necessity is such a remodelling of the staff charged with the application of the existing law as shall prevent its falling inoperative, as it is for the most part at the present moment. As a commencement, the number of inspectors of nuisances should be multiplied by ten, and all the officers charged with the execution of the Acts for the better securing of the public health should be the servants of the Crown, and not of vestries and similar bodies. On this point we cannot do better than quote from the article under notice:—

"It is frequently said that the reason why the vestries do not get rid of unhealthy dwellings is that many of the vestrymen are holders of small house property, and that selfish private interests thus prevent the discharge of public duties. In the absence of direct evidence it is scarcely fair to fasten upon a whole body of men who perform important public functions without fee or reward a stigma which is only partially deserved. People seem to forget that Acts of Parliament do not administer themselves, and the sanitary machinery of London is standing comparatively idle for lack of men to work it. There are 5,000 tenement houses in Whitechapel, and only two sanitary inspectors. If these officials devoted their whole time to this work alone, they could, perhaps, visit each tenement once in three months,—an inspection which would be ludicrously inadequate. Weekly inspection at least is necessary, and this duty would require twenty-six inspectors in place of two."

The reviewer is perhaps a little inconsistent in saying that "the actual condition of London is *absolutely* unknown," but that "things are not so bad as they were forty years ago." We are of opinion that many evils which then existed have been removed, and many which remain have been lessened in extent and in intensity. And in this fact we see the best hope for the future. Many things are conspiring towards the ultimate reduction, if not extinction, of the evil we deplore. In the first place, the danger of the neglect of conformity with the laws of health is better understood and appreciated; and, in the next place, our national education scheme is bringing this fact home to millions whom it could in the old days never have reached. An improved education will induce, in the very poor, improved views of life, and these will lead to a higher standard of home comfort. The temperance movement in its many forms is reaching vast masses of the people, and is working on the side of the sanitarian. The most hopeless part of the present posture of affairs is the apathy of the chief sufferers. But this apathy will disappear under the growth of knowledge and the self-respect which temperance brings.

Miss Octavia Hill says that the desired reform will not pay; that no reform pays in a narrow sense; and that the dulled conscience of the community, which allowed the evils to grow, must now make amends by redressing them at the public cost. The Reviewer evidently endorses this theory; but the public may not like to buy off the "owners" who have been reaping a golden harvest from the degradation of their fellow creatures, and then assume the whole charge of rectifying the wrong. Such a course would hardly be equitable, any more than it would be just to mulct the unfortunate landowner for the iniquity of his lessee. The Reviewer's advice that "few edicts should be promulgated, but that those few should be well observed," strikes at the root of the matter so far as the amendment of the present existing tenements is concerned. How to face the great question of substituting others more suitable he cannot see,—except by advising the Government, as banker of the public savings, to lend those savings to local bodies to lay out on the desired improvements to be recouped from the pockets of the savers. Amongst other things he would amend the Metropolitan Building Act. But first he should understand that of which he complains. He says truly that it is therein enacted that an air space of 100 square feet is all that is prescribed per dwelling, however large that dwelling may be; but he says what is not the fact when he avers that so soon as the district surveyor's certificate is given that 100 ft. may be built over, and is so built over, constantly. Let him consult Clause IX. of the same Act, and admit over-haste in his strictures of a useful though imperfect and much-abused statute.

NORTHERN ARCHITECTURAL ASSOCIATION.

WE extract the following passages from a very practical address delivered by Mr. F. W. Rich, the President of the Northern Architectural Association, whose head-quarters are at Newcastle-on-Tyne:—

One of the fruitful causes of the so-called unpopularity of architects arises in the fact of their frequently not being allowed to carry out their designs in their integrity. Architects are often liable to fall in, in a sort of friendly way, with the notions of their clients, be they governments, corporations, or private individuals, and have often afterwards to repent it. I need hardly remind my friends that an important part of the duty of an architect is to see and be able to certify that the work carried out under his supervision has been done in a satisfactory and workmanlike manner (words we often hear), and upon this arises an element of so-called unpopularity, which is attributable in a very great measure to the very medium degree of excellence exhibited by many of the workmen of the building trades, and the consequent want of solidarity between themselves and architects.

That there are good workmen in the building trades no one will deny, but they are in a very small minority.

A general would be nowhere with his battle, were it not for the good quality of his soldiers. The workmen are to the architect what the soldiers are to the general. Let an architect plan ever so cunningly, his work may be all swamped in its execution, and for this he is held responsible.

But from what source do we draw our workmen? Will it be believed that, practically, there is scarcely an apprentice in the majority of the building trades in Newcastle. From whence, then, do we draw our supplies? I am afraid we get the majority of our men from the "jerry" source, or, in other words, the speculating builders; and a few are drafted from the country. Time was, and not very long ago either, when every workman had to serve seven years' apprenticeship, and could produce his indentures to that effect. What have we now? A youth in going to business can scarcely get into the best shops (for I have discussed this question frequently with some of the principal contractors in this city, and I get one general answer,—"That apprentices are more bother than they are worth." A more deplorable answer can hardly be imagined). So what does the youth do? He gets employment with the jerry builder, passes two or three years in this slipshod school, and then launches himself on the world as a full-blown journeyman, often before he is eighteen or nineteen years of age. No wonder that with such a training we should get such indifferent work, for which architects too often get the blame. If the workman is not fitted to do good work, no amount of supervision on the part of an architect can alter him. It can only be done by a thorough training in youth.

While speaking of apprentices in the building trades, we must not forget our own, or pupils as we call them, and we shall find a state of things which is not altogether satisfactory, but arising from different causes to those of the building trades, and if this association can do anything to better this state of things, it would deserve the thanks of the whole profession.

I have no doubt every gentleman present knows the difficulty of getting thoroughly good and reliable assistants; and no wonder. A youth under present conditions remains at school until he is about eighteen years of age, and then comes into an architect's office to try to master in three years a somewhat lengthy programme. As I said before, seven years used to be considered a fair time for an apprentice in the building trades to master his trade. Now we generally consider there are roughly seven trades in what we call the building trades, yet the architectural pupil very frequently endeavours to master, in about three years, not only the fine art and theoretical portion of his profession, but also the principles of the whole of the building trades which will enable him to understand his work. I do not mean to say that it would require the pupil seven times seven years to master all this fine art, theoretical, and practical work (although, goodness knows, it takes a long time); but I do mean to say that with the facilities available in provincial towns a youth has not a chance, when in an office, of becoming proficient as an architectural draughtsman in the time allotted to him; and what I mean to adduce from these facts is this, that this association should endeavour to found some source of education (a Chair of Architecture in the College, for instance), or class-work in connexion with some institution, where a youth could largely augment his knowledge, either in the day time or in an evening (for in this high-pressure age in which we live there is little time for leisure), and which would go hand in hand with his daywork at the office, and render him at the end of his term a really useful member of a responsible profession.

Touching upon what may be called public matters, I think I may say that the thanks of this association are due to the Corporation of Newcastle-on-Tyne for the admirable and impartial competitions which took place last year for the Police Barracks* and Fever Hospital. The competition was issued to the public on what seemed to me to be fair conditions. The drawings were adjudged by a competent and well-known architect, and were exhibited without stint to the public. The few murmurs that followed in the wake are matter for regret. We cannot all win, and a loser should always die game.

It is most probably within the knowledge of every gentleman present, that there will most likely be other competitions to follow at an early date for other public buildings, abattoirs, baths, college, and perhaps a town-hall; and it is to be hoped they may be carried out on similar lines to the last, or in case those conditions were not so fair as might be desirable, I have no doubt the members of the City Council, as practical men, would listen to any suggestion this or any similar association might wish to offer.

While on the subject of public buildings, we come to the very important and interesting question of where to place them, and here a very curious fact presents itself. Our large cities and towns are developing and extending at an enormous rate. The old thoroughfares (like the old sewers) are inadequate.

Buildings are now required that fifty years ago were not dreamed of, and there is a difficulty in procuring suitable sites for them. It is clear we must augment our thoroughfares in what we call improvements to the city, and that all our public buildings should adorn or beautify the city. This, it must be admitted, is a very broad subject. But is it not a fact that all so-called improvements not only in this city, but almost in all others, are *not* the result of a well-devised and comprehensive scheme, but one worked out piecemeal by the Council collectively, where nearly every member indi-

* Two of the premiated designs for these we shal illustrate shortly.

vidually would hesitate before attempting such a task? Let us see what is done by a neighbouring Corporation, the River Tyne Commissioners. They have charge of what is now a noble river. It was not always so. They have improved it. But they do not attempt to do it themselves. They placed the matter in the hands of an eminent man years ago, and consistently follow a well-devised and comprehensive scheme which may yet take many years to complete. I do not mean to say that a city like this could be improved at such a rate as the river has been; but I do say this, that if the planning of the improvements to a city were placed in the hands of a similar eminent man (and it seems to me that, as the question is of such architectural importance, that man should be an architect), and he was asked to thoroughly consider, and show the best way a city could be improved to meet the existing and future wants, I have no doubt the result would be similar to what we see in the river improvements, viz., a whole scheme, a comprehensive plan in every respect, and not one of shreds and patches.

THE INFLUENCE OF DOCTRINE ON CHURCH ARCHITECTURE.

ON Monday evening last the Rev. C. Hargrove delivered a lecture on "The Influence of Doctrine on Church Architecture," in the Lecture Hall of the Leeds Architectural Society. Mr. Birchall presided.

The lecturer said that the business of the artist was to educate and gratify the taste of the public, but the architect more than any other artist worked for all, for he could not keep his work to himself or for his employers, even if he desired to do so. But most of all those specially interested in religion were entitled to give an opinion on an art which began with religion, which in the service of religion attained its greatest and most enduring triumphs, and which inevitably reacted, to exalt or degrade, upon the religious ideas it gave effect to. The subject of the lecture was, how the forms of religious architecture were moulded by beliefs which they served, or at least how they had been in the past and must be again if our architecture was to be a living and not merely an imitative art. All religious buildings might be divided into two classes. There were those which were built for the sake of the object to which worship or reverence was paid, and those whose purpose was to serve the worshippers. These distinct objects might be united and often were confused, but according as the architect had one or other in his mind as the chief end and aim of his work, would the whole plan of the building vary. The first was the object of almost all, perhaps all, pre-Christian, and, outside Mahometanism, all un-Christian buildings of any size and pretensions. The worshippers might gather round the temple in porch or portico, within it only the priests were allowed, and within the sacred shrine perhaps only one of them, or the shrine might, as in some Hindoo temples, be inaccessible. After giving various examples of the first class of buildings, the lecturer went on to say that the second class probably had its first example in the Roman basilicas, which from places of public meeting for the administration of justice were adopted by the Christians for public worship and preaching. This became the general model for all Christian churches, the aisle, once sheltered porticos round the open court, being taken into the building, and all the parts of a Gothic cathedral were but developments of the basilica. But in Roman Catholic worship the great need was to have the altar so situated that all might assist at the sacrifice, following it with their eyes rather than with their ears; and secondly, as there were many sacrificing priests, and many saints who were secondary objects of worship, there should be room for more than one altar. Hence the invariable feature of all Mediæval churches, naves for the people, choir for sacrificing priest, and the endless variety of plan accordingly as chapels were thrown out here and there for an altar in honour of some saint. But since the Reformation church architecture seemed to have lost the very life of art. It no longer sought to express an idea or adapt material forms to spiritual ends. It tried only to effect something strange, or beautiful, or merely useful. There were now three forms of Christian worship,—the sacrificial, the liturgical, and the congregational. An architect, before attempting a plan, should know which of these forms he designed to serve. At the present time it was seldom or never asked that the building be simply in honour of God or the saints. Every church was a meeting-house, but the purpose of meeting varied. The centre of unity might be the altar, or the choir, or the pulpit, and the plan and style must vary accordingly. It was the worst condemnation of a Dissenting chapel to say it would do for an Anglican church, or, again, of the Church that it might be mistaken for a Roman Catholic place of worship. Different ideas were associated with the three forms, and should be expressed in the buildings.

MR. WHICHCORD'S APPEAL TO "ORGANISE."

SIR,—I am not an architect, but you will, perhaps, allow me space for a word or two respecting the appeal at the latter part of the letter of Mr. John Whichcord, which appeared in the *Builder* of the 5th inst. (p. 40).

My professional work brings me into frequent communication with architects in various parts of the country, and from this and a perusal of the *Builder* I am kept partially posted up in architectural questions. Many of my more agreeable recollections are of dealings with members of the profession, with whom I therefore feel some special grounds of sympathy.

Mr. John Whichcord says the Royal Institute is the only body which can help his profession. As an outsider I should venture to assert that this is but a half-truth. A large body of architects in active practice throughout the country care not for the Institute or its ways; others, men of high professional tone, hold themselves free from all organisations, and feel as though they were strong enough to stand without "society props," as I have heard it phrased. Mr. Whichcord will excuse me when I say that until these men, *and until all the professional architects in the kingdom* (whether now allied to any societies or not) can be induced to throw in their lot with the Institute, the influence of that body will never be the factor with architects, nor with public bodies, nor with the public at large, that it ought to be, and may yet become. Now, it seems to me that, if those who regard themselves as persons of importance in the profession, would step down from their pedestals for a brief period and, in a thoughtful and kindly way, consider what could be done to weld the scattered architects of the country into one solid phalanx, it is possible that they might find their efforts seconded by many who are now utterly indifferent. This would form a fitting programme, let me say, for the jubilee year of the Institute, and might usefully occupy the organising faculties of Mr. Whichcord, Mr. Cole A. Adams, and other active members.

If there is nothing in the conditions of membership which prevents architects joining the Institute, it ought not to be an impossible task to get the outlying body of architects throughout the country to add their names to the roll. Let me, however, ask one plain question, which perhaps Mr. Whichcord will answer through your pages, in an equally plain way. Do Mr. Whichcord and his co-partners really wish to extend the membership of the Institute, so as to embrace all the architects of the kingdom? Or do they wish to make their society a "close" corporation, representing but a minority of the men in the profession? If the former, how does the Institute propose to reach the mass of architects now outside of it? It appears to a plain man like myself that if the Institute could, in its fiftieth year, say that it had trebled or quadrupled its membership, this would be a fact in its history not unworthy of recording.

Let me say, in conclusion, I am convinced that if the architectural profession is to be lifted out of the troubles which "encompass it about," this will not be accomplished by anything short of legislating for the many, and securing a harmonious and united pull from the whole team. Who is to take the initiative? Will the Council of the Institute? Or will it be left to some other society to address the various architects of the country?

There is no doubt in my mind but that if the Institute would lay aside for the moment its great manner, and apply itself to the work of benefiting the whole profession, by getting the names of all British architects on its roll, it would ultimately be in a position to speak "as one having authority," and command that respect which numbers always enforce,—a respect, it is well known, that it has not now got; and let me add, which it will *never* have until such time as it has succeeded in enrolling those architects who now go their way independent of it. It may be objected that in enrolling *all* practising architects, some doubtful men might be included; this, if so, would speedily work its own remedy. Once that all architects are banded together in one association, the "disbarring" of a misbehaving member would be felt as a penalty having some force, and thus lead to good behaviour all round, and a corresponding rise in public estimation.

The members of the Council cannot do better than apply the advice of their colleague, and "organise," until they have made Conduit-street the legislative centre of the profession.

D. E. C.

MONUMENT TO THE LATE GENERAL MARGUERITTE.

THE Town Council of Manheulles, Lorraine, in response to the expressed wishes of many inhabitants of the commune and many military men, are setting on foot a monument to the memory of General Margueritte, who fell at the head of his division of cavalry in a charge at Sedan, having before been distinguished by many brilliant episodes in his military career. The scheme has the special countenance of the French Government, and the Minister of the Interior is charged with seeing it carried into execution, the requisite funds being raised by public subscription; for which a special appeal is made to the inhabitants of the commune of Manheulles, to those of "*notre chère* Lorraine," to the inhabitants of Port-à-Mousson, where the General distinguished himself in an action on August 12, 1870, and the inhabitants of Sedan and its environs. It is intended that the pedestal should bear plaques or reliefs commemorating the names of those of the canton des Fresnes who fell in 1870-71.

The estimated cost of the monument is about 30,000 francs, and its design has been entrusted to M. Lucien Leblanc, architect, who is connected with the public works department, and M. Albert Lefeuvre, sculptor, Chevalier of the Legion of Honour. It is expected that the monument will be completed and inaugurated some time in April next.

INTERNATIONAL HEALTH EXHIBITION.

WE have received the following communication from the secretary:—

The Sub-Committee on Heating, Lighting, Ventilating, and Smoke Abatement have prepared a memorandum indicating the principal exhibits which it is intended should be comprised within Classes 24, 25, and 26 of the Exhibition. In Class 24 will be included grates, stoves, kitcheners, ranges, boilers, &c., for domestic use, and all methods of warming, with or without provision for ventilation. Domestic kitcheners will be included in this class, but appliances for cookery on a large scale will more properly be arranged under Class 6 (Cookery, &c.). Furnaces and steam boilers for manufacturing operations are not considered to be within the scope of the present Exhibition. In Class 25 (ventilators, &c.) will be included special appliances for ventilation, other than those which may be considered more suitable for Class 24. These will include means for cooling the air supplied to rooms; means for improving the condition of the air in rooms; methods for testing air; the results of experimental researches into the state of air vitiated by combustion or by respiration; results of experiments on ventilation, and any other means of effecting improvement in matters relating to this class, or of diffusing knowledge about them. Class 27 takes in lighting by any means, electricity, gas, oil, candles, &c. Electric lighting, however, is to be limited to illustrations of its application to domestic lighting. Its use on a large scale will be practically illustrated by the arrangements made for lighting the Exhibition itself. The commercial manufacture of gas is not included, though its production on a small scale for private use is. Exhibits showing the progress of domestic lighting, and affording means of comparison between old and new systems are specially desired. Photometric and other tests for illuminating materials will be admitted.

It is also desired to illustrate, in as practical a manner as possible, the relation of industrial conditions and processes to health; and to the sub-committee charged with advising on this department of the Exhibition the name of the "Workshop Sub-

Committee" has been given. The place of production of all articles used by man is for the present purpose spoken of as the "Workshop." The following heads show the principal subjects which the subcommittee are anxious should be illustrated in the several classes of this department, the illustrations being expected to include alike the conditions of injury to health and the means proposed for improvement:—(*a*) Ventilation of the workshops,—by simple discharge of internal air; by destroying the offensive or injurious quality of discharged air. (*b*) Effluvium nuisances,—by condensing and utilising vapours; by consuming vapours; by other means, as in gas works. (*c*) Dust nuisances, *e.g.*,—in needle-grinding, mother-o'-pearl working, in weaving-sheds. (*d*) Danger from mineral poisons, *e.g.*,—in arsenic works, white-lead works, playing-card making, card-bronzing, phosphorus and match manufacture. (*e*) Danger from animal poisons, *e.g.*,—in wool-sorting, rag-picking. (*f*) Prevention of accidents in the workshop, *e.g.*,—Protection against heat or injury to the eyes; protection against explosions in the mine and elsewhere. Besides apparatus used, or proposed for use, with a view to minimise danger to life and health, the exhibits may comprise models, drawings, specimens both of harmful products and improved products, &c., and the committee will be specially glad to receive collections of specimens, models, diagrams, photographs, &c., showing existing evils or noxious conditions which have been modified by recent improvements.

THE FALL OF A RAILWAY BRIDGE IN LANCASHIRE.

THE adjourned inquest on the bodies of Mr. J. F. Hammonds and the six other *employés* of the London and North-Western Railway Company, who lost their lives on Sunday, the 6th inst., by the falling of Coppull-lane Bridge, between Wigan and Preston, was resumed on Monday last at Coppull, before Mr. W. Gilbertson, county coroner for the district. Mr. Thompson, solicitor, of Euston, London, appeared for the London and North-Western Railway Company, who were also represented by Mr. S. B. Worthington, chief engineer of the northern division; Mr. W. B. Worthington and Mr. R. Jones, assistant engineers for the district; Mr. Tongue, district passenger superintendent; Mr. Taberner, station-master, Wigan; and Mr. A. W. Ditchfield, permanent way inspector. Mr. Thompson appeared for the London and North-Western Railway Company.

Mr. A. W. Ditchfield, permanent way inspector, said he had charge of this district. He knew the Coppull-lane Bridge, and had instructions from Mr. Worthington to assist in removing it. They commenced to clear the bridge on the Friday by removing the earth and roadway over it. Mr. Hammonds went from Manchester with witness to the bridge, and they had completed the preliminary work by about four o'clock on the Saturday afternoon. The bridge was then bare to the brickwork, except the lower portion of the parapet wall. On Sunday morning witness went again, Mr. Hammonds arriving on the spot about half-past eight. The arch of the bridge was much flattened, but no change had taken place in it for some time. On the Sunday morning, before the arrival of Mr. Hammonds, they started to remove the remainder of the parapet. On Mr. Hammonds coming to the spot they unloaded some timber to make the temporary roadway. Mr. Hammonds about half-past nine went on to the bridge, and ordered Donald to take out the key-brick of the outer ring of the arch, which was of two-brick length, or 1 ft. 6 in. Witness did not think there was any danger: he was under the bridge several times. Hammonds stopped on the bridge for some time, but before the rim had been completely cut through he went on to the line in order to give instructions as to the uprights to be placed on the line for the beams. Hammonds, who was standing in the 6-ft., said he should like to have some breakfast, and witness just then left him to leave his coat at the platelayers' house. As he was returning he heard the bridge fall. This would be about ten minutes after the passenger-train for the North had passed underneath. The arch was considerably flattened, but he had not noticed any change in it for the last few years, although he had frequently looked at it.

George Donald, ganger, said he was, by orders, assisting in the pulling down of the bridge. He had known the bridge for a dozen years, and had never seen any change in it during that time. It was always a bit "flattish." When Mr. Hammonds arrived on Sunday morning, the roadway and everything else had been removed from the top of the bridge, and the bricks of the arch laid bare. Mr. Hammonds went on the top of the bridge just before the train came by, got hold of a crowbar and barred the key-brick out on the north side of the bridge, and told witness and two others to remove that course of bricks across the bridge. They commenced taking out the bricks about 9.30, and finished five minutes after the train had gone by. Mr. Hammonds went underneath, and witness stepped on to the beams, waiting further orders. He had only stood there a short time when the arch, without the slightest warning, fell with a crash. He did not see whether the centre of the bridge rose before it fell; he did not notice anything of the sort.

Mr. S. B. Worthington, of Manchester, Engineer for the Northern Division of the London and North-Western Railway Company, said he had known this bridge for twenty-four years, that being since the time when he took charge of this portion of the North Union Railway. The arch was a semi-ellipse, but, as described by one of the witnesses, rather flat on the crown. He believed the arch would take this shape shortly after it was built; it had been so ever since he had known it. It was not, in his opinion, by reason of any process of decay that the bridge became flattened. The arch was 18 in. thick at the crown, and gradually widened out until it was 4 ft. at the haunches. It was a substantial structure, and was erected according to the usual mode of construction. About two months ago he was informed that there was a slight crack in the arch. From the description he did not anticipate any danger; but taking all the circumstances into consideration, and especially that though there were no coal workings to their knowledge underneath the bridge, mining was carried on in the neighbourhood, he thought it better to order the removal of the bridge, and cast-iron girders had been ordered for the purpose of replacing it. The mode adopted for taking down the bridge was undoubtedly the right one, but the time adopted was not the right time. Hammonds was the bridge inspector for the Manchester district, and was a man of very large experience of this class of work. He had taken down many bridges, and for four years past had been engaged, amongst other things, in heavy repairs to the Morley tunnel in Yorkshire, which was a difficult and troublesome operation. During forty years' experience of this class of men, witness had not known one in whose assiduity and ability he had had greater confidence. Hammonds himself decided as to the mode of taking down the bridge. He, however, commenced too soon. The men should not have commenced to take the bricks out until a short time before they meant to drop the arch. There were several trains to pass when they commenced the work, and if they had delayed taking out the bricks until eleven o'clock they would have had ample time to clear everything away before four o'clock in the afternoon, when the next passenger train passed, and the accident would not have happened. This bridge was built in 1836. So far as he could judge, there was nothing on the face of the bridge to make Hammonds suppose that it was defective in any way, but he was bound to say that on looking at the wreck the mortar appeared of a more crumbling nature than he should have expected.

In reply to a juryman, witness said that the instructions issued stated that the bridge had to be pulled down between half-past eleven and four o'clock. The impatience to push forward the work seemed to him utterly unaccountable.

The jury returned a verdict to the effect that the deaths had been accidentally caused by the premature falling of the bridge.

The foregoing report is condensed from the *Manchester Courier*.

THE CONFERENCE OF FRENCH ARCHITECTS AT NICE.

SINCE writing the paragraph in our "Notes" (see *ante*) calling attention to this intended Conference, we have received a very courteous communication from the President of the "Société des Architectes et des Ingénieurs des Alpes Maritimes," M. Levrot, calling attention to some further subjects of interest to be considered in the programme of the meeting, and adding "Nous serions heureux que nos honorables confrères Anglais, si forts en matière d'hygiene, si compétents lorsqu'il s'agit de la Grèce ou de l'Inde, nous fassent l'honneur et le grand plaisir de participer à nos travaux." The Congress, it appears from the report annexed to M. Levrot's letter, is in fact a double one; a congress not public, and local (*régional*), held from February 8th to 11th inclusive, and an international congress held from the 12th to the 19th inclusive. The first is more for the grave matters of professional status and practice (as mentioned in our "Note"), the second more for the discussion of artistic subjects. The dates and subjects of meetings of the international congress are as follow:—

Tuesday, Feb. 12th.—Opening of the Congress. Paper on "Polychromy applied to Constructions" (by M. Chas. Garnier). Afternoon: visit to the International Exhibition at Nice.

Wednesday, 13th.—"The simultaneous Treatment of Architecture, Sculpture, and Painting." Various visits.

Thursday, 14th.—Visit to the Principality of Monaco; the Palace, Cathedral, and Museum. Conference on the Architecture of Summer Towns and Winter Towns.

Friday, 15th.—"Cimiez: its Arena, Forum, and Abbey." Discussion on the Sanitary Work of Towns.

Saturday, 16th.—Excursion from Nice to Esterel.

Sunday, 17th.—Excursion to Cannes. Public Fête at the Place d'Armes.

Monday, 18th.—Excursion to San Remo and to Ventimille and its ancient theatre.

Tuesday, 19th.—Discussion on the Marbles and Building Stones of the Neighbourhood. Consideration of the Industrial Products connected with Construction. In the evening, closing dinner.

Further information and prospectus can be obtained from the Secretaries for the "Séant à Nice," 23, Avenue de la Gare, Nice; and it is desired that those wishing to be present should apply before the 31st of this month if possible.

ROYAL ACADEMY.

ADMISSIONS TO THE ARCHITECTURAL SCHOOL.

Upper School.—A. Howse, A. Kent, and E. S. Norton.

Lower School.—L. Ambler, C. S. Appleton, W. H. Bidlake, F. Brown, E. A. Coxhead, H. W. Crickmay, A. Dovaston, W. J. W. Ferguson, P. Figgis, H. R. Goodrham, F. C. Hart J. Lord, F. S. Ogilvie, E. W. Pickford, T. B. Rutherford, H. D. Walton, and R. W. Williams.

Probationers.—C. J. L. Hall, A. B. Mitchell, J. E. Newberry, E. H. Sedding, E. H. Selby, Van J. A. Straaten, and F. W. Troup.

SALES OF BUILDING LAND AT THE EAST END.

ON Thursday in last week, by order of the Metropolitan Board of Works, Messrs Moore & Moore submitted to public competition at the Auction Mart, Tokenhouse-yard, a large number of freehold building sites situated in Whitechapel and Wapping. The first portion of the property offered was that in Whitechapel, comprising a total area of nearly three acres, and situated close to the London Docks, the Mint, the Tower, and railway goods stations. The property was offered in four lots, and the particulars stated that the vendors, under the provisions of the Artisans' and Labourers' Dwellings Acts of 1875-82, was bound to sell or let the lands for the purpose of the erection thereon of dwellings for the working classes, and that the purchase of each lot would be subject to the obligation to build and maintain such dwellings. The first lot offered, situated near Royal Mint-street, with a frontage of 179 ft. to Cartwright-street, and containing an area of 6,398 ft., was sold for 950*l.* For the adjoining lot, next offered, and containing an area of 25,422 ft., there was a very animated and warm competition between two bidders. The lot was put up at 1,000*l.*, when the advance of 500*l.* was at once made, and the hammer ultimately fell at 3,650*l.*, the purchaser being warmly cheered by the company present. The two following lots, one containing 46,420 ft., and the other 52,000 ft., were withdrawn at 5,490*l.* and 4,290*l.* respectively, being the highest sums offered. The Wapping property was next offered. It consisted of thirteen lots, comprising property producing 410*l.* per annum, together with freehold building land, close to the Wapping entrances to the London Docks, and described as well adapted for the erection of warehouses or manufacturing premises. There was only a very limited demand for this property, and the only lots sold were a freehold granary in Wapping High-street, let on lease expiring in 1887, at 40*l.* per annum, which realised 790*l.*; and a freehold warehouse near Wapping High-street, let on lease expiring in 1888, at a yearly rental of 60*l.*, which was sold for 1,100*l.*

Last week Messrs. Moore & Moore offered for sale at the Auction Mart, Tokenhouse-yard, a plot of freehold building land in the Broadway, at Stratford, covering an area of about one acre. There was an active competition for the property. The first bid was 1,000*l.*, and it was ultimately sold for 1,950*l.*

St. Alban's Abbey.—The Freemasons attending the services at St. Alban's Abbey have recently made an addition to the pulpit (which was presented by the Freemasons of England) in the shape of a pair of three-light brass standards for candles, designed by Mr. John Oldrid Scott, and manufactured by Messrs. Henry Marlow & Co., of 127, Regent-street.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

Jan. 4, 1884.

649. T. Jones, Sedgley. Floors or pavements and wall linings.
650. T. Jones, Sedgley. Window-fastenings.
657. T. W. Twyford, Hanley. Connecting supply apparatus with water-closet basins. (Com. by E. Aspinall, New York, U.S.A.)
661. E. Woolfenden, Rochdale. Ventilators.
670. T. G. Barlow, Wexford. Cowls for chimneys, &c.
671. A. Putney, London. Wood floorings. (Comp. Spec.)
703. J. B. McCallum, Blackburn. Water-closets.
711. G. Bisley, London. Fasteners for window sashes.

Jan. 5, 1884.

714. T. W. Helliwell, Brighouse. Glazing greenhouses, &c.
734. W. J. Wheeler, Richmond. Wood paving.
790. G. Homewood, Cuckfield. Water-waste preventers.
799. E. H. Harling, London. Window-fasteners.
801. T. P. Bache and G. Salter, West Bromwich. Door-springs.

Jan. 7, 1884.

822. A. C. Smith, London. Spiral updraught exhaust cowl.
830. D. W. Petrie, Liverpool. Spring apparatus for doors.
837. J. G. Strong & Sons, Dublin. Cast-iron water-closets.
858. F. H. Matthews, Slough. Glazing glass structures. (Comp. Spec.)
881. T. R. Shelley, Birmingham. Glazing structures.
887. S. Reeve, London. Warming and ventilating apartments, &c.
899. F. C. Biddiscombe, Manchester. Cisterns for water-closets, &c.
902. J. G. Stadler and E. Schmid, Switzerland. A ridge tile.

Jan. 8, 1884.

945. F. R. Waildegoose, London. Screw-down safety sash-fastening.
953. W. E. Baker, Aldershott. Plastering machines.
955. J. D. Wright, London. Chimney-top and ventilator.
1,003. H. C. Collyer, London. Supporting and actuating Venetian blinds.
1,013. F. Newman, Ryde. Flushing doors for sewers, &c.
1,019. A. H. Smith, Bristol. Stoves for heating and ventilating.
1,020. T. Jones and S. Griffin, London. Decorative tiles.
1,022. E. Edwards, London. Movable Venetian blinds. (Com. by A. Cheneval, Maffe, Belgium.)

Jan. 9, 1884.

1,029. F. F. Brown, Chester. Parquet floors.
1,046. H. Sutcliffe, Halifax. Water-closets.
1,061. J. Fagan, Skipton. Water-closets. (Comp. Spec.)
1,062. T. Morris, Bolton. Automatic tubes for hot-air heating.
1,088. J. Beckett, Crosshill. Ventilating devices for house-drains.

Jan. 10, 1884.

1,112. T. S. Wilson and H. T. Johnson, Manchester. Ventilators of soil-pipes, &c.
1,125. J. Everard, Birmingham. Window-blind fittings.
1,155. F. L. Merrill, London. Centripedal cowls.
1,159. J. Parrott, Wallington. Trap and ventilator for soil or waste pipes.
1,185. R. Walsham and J. Walsham. Paving and other tiles.

NOTICES TO PROCEED

have been given by the following app icants on the dates named :—

Jan. 8, 1884.

4,227. T. J. Palmer, Carshalton. Decorative material for walls. Sept. 3, 1883.
4,257. R. Adams, London. Toothed racks for opening and closing fanlights, windows, &c. Sept. 4, 1883.
4,308. J. C. Blomfield, London. Manufacture of bricks, &c. Sept. 7, 1883.

Jan. 11, 1884.

4,384. E. J. Smith, London. Locks or fastenings. Sept. 13, 1883.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

ABRIDGMENTS OF SPECIFICATIONS,

Published during the week ending January 12, 1884.

2,417. J. Whitehouse, Tipton. Stench trap for street gutters. May 12, 1883. Price 2d.

The box is divided by vertical partitions depending from the grating on the top. The outlets are made near the top of the box, and are governed by valves. (*Pro. Pro.*)

2,459. T. Hale, Claydon. Domestic fire-escape. May 16, 1883. Price 6d.

A cross bar that is placed across the inner side of the window is supported by uprights standing on the sill. A jib is supported from the cross bar, and, over the roller, on the end thereof, passes a rope, attached to which is a canvas bag.

2,881. H. H. Leigh, London. Fire-grates. (Com. by Goujet & Cie., Paris.) June 8, 1883. Price 6d.

Rocking bars are used, which have a conical ridge and two fluke-like extensions on their upper sides with openings for the passage of air.

IRON AND CONCRETE.

SIR,—In reference to your note of last week, I have only to thank the gentlemen who have taken part in a correspondence which has produced such very instructive letters [see pp. 649, 704, 773, 804, 842, and 876 of last volume of *Builder*, and pp. 42, 80 of current vol.]

If those gentlemen would decide upon the composition of two beams, each 15 ft. long, by 1 ft. 10½ in. wide and 12 in. deep, one to be of iron and concrete, and the other of concrete only, and have them made and seasoned and tested with a central load of 7½ tons (or half the weight placed upon Lieut.-Colonel Seddon's slab), my original question of Nov. 17, 1883, would be answered, and I should be willing to contribute a guinea towards the cost of such tests.

The only question is whether any other members of the profession consider the subject of sufficient interest to contribute also, in order to verify a system of construction which they could recommend to their clients for economy and safety. EDWARD J. TARVER.

Jan. 16, 1884.

"ENSILAGE."

SIR,—As a subscriber and reader of your valuable paper, I have noticed many interesting articles relative to the construction of silos and the preservation of green crops. I paid particular attention to the article headed "Improved Form of Silo" in your issue of Jan. 5th (p. 41),—improvements which I see in your issue of the 12th, have been patented by Mr. Potter. In your same number appears, under the heading of "Ensilage," and signed "B.," a letter asking any one who has had experience in the construction of silos as to the possibility of the plan proposed to be adopted by him proving a success. I see no reason whatever why the plan should not succeed. A great deal depends upon the class of cement used and the proper mixture of the same. But I should advise your correspondent, "B.," if it be possible to fill in the gravel-pit to a height of say 1 ft. or 1 ft. 6 in. above the water-line, so as to allow the bottom of his silo to be at least 2 ft. above the water-line, the floor being concrete, 6 in. or 9 in. thick, floated over with 1 in. of Portland cement and sand in equal parts. The walls may be carried up to any height required, the ground being raised at one end so as to allow of easy approach to the top of the silo for filling and emptying purposes.

If I am not trespassing upon your space, perhaps the following method of silo construction may be of use to some of the many persons who are daily making the best and cheapest method of preserving their crops in a green state their study. The following silos were built partly under my superintendence in the fast-growing State of Kansas, U.S.A., and are owned by the Consolidated Sheep Ranch Company, and used chiefly for the preservation of green rye. The silos were built in a naturally-formed ravine or the bed of a dried-up creek, so that there was little or, practically speaking, no labour in excavation. The walls were built entirely of rough-hewn stone, taken from a quarry near by, and lined inside with cement, 1 in. thick. The walls were carried up perpendicularly from the bottom of the ravine to the level of the surrounding part of the farm, a depth of at least 45 ft., and filled in on two sides and one end with soil, so that the silo was entirely underground, with the exception of the one end which remained exposed to view. At the bottom of the exposed end of the silo was formed an opening filled in with a strong-framed door, made to open outwards, and from the opening thus formed the ensilage is taken, placed in carts, and carried to the different flocks. This doorway is approached by a road formed on an easy grade. The silos are built in pairs, each pair being covered by one roof, and separated only by a division wall, with an opening formed in the bottom, so that when the first silo is emptied the second one can be disposed of by the same means. By this arrangement two entirely different crops may be preserved. The silos are filled at the end which runs level with the farm. At this end stands the steam-cutting machinery. The crop when cut is carried by means of tip-up boxes, running on iron rods suspended in the roof-space, and travelling along by means of a chain and pulley, two to each silo, the rods being about 12 ft. apart, and running the longitudinal way of the building. This simple process is worked by one man attending to the boxes, besides those required at the machine. The boxes can be pulled up at any point, and tipped up, the contents finding their own level. It is necessary to send a man down occasionally to level over the surface as the silos are filled. But even that trouble may be saved if care is taken in the proper working of the tip-up boxes. When filled the crop is weighted in the ordinary way, and as the ensilage is taken from the bottom it is not necessary to remove any of the top weight or covering. The great object is to keep the crop as air-tight as possible. By adopting this method of silo building, filling, and emptying, there is undoubtedly a great saving in labour alone. The question for the farmer is, which is the cheapest and best way of preserving a green crop? And if it comes to a large outlay of money on inventions which in themselves are undoubtedly good but practically unnecessary, and which do not deal with the chief object in view, viz., that of keeping the silo as air-tight as possible from the time it is filled until the day it is emptied,—the farmer will find that it is impossible for him to preserve ensilage to feed his stock for market at a profit such as he might gain by adopting the simpler method. FRANK ROBERTS.

P.S.—I forgot to state that the size of each silo is about 40 ft. by 40 ft. by 45 ft. deep. Each block of two would be about 90 ft. by 40 ft. by 45 ft.

WATER SUPPLY OF THE CITY OF LONDON.

SIR,—The City Solicitor has issued a circular directing attention to the Bill proposed to be introduced by the Corporation of the City of London with reference to the above question.

The Bill appears to have been very carefully drawn on lines equally equitable to the water companies and to the consumers. One leading feature of the Bill is to give the right to a consumer to demand a supply of water by meter at such rates as shall be deemed right by the Legislature.

This right exists under the 41st section of the New River Company's Act, where the supply of water is required for other than the purposes named in the 35th section, viz., *domestic* purposes.

My contention with the New River Company is and has been that the water supplied to these and other premises belonging to me in Billiter-street is not for domestic purposes, but for commercial and sanitary purposes.

The premises are of the *rateable* annual value of 1,000*l.* and 792*l.* respectively, and there are twelve water-closets in each building.

The quantity of water actually consumed in the four years ending January, 1883, as registered by Beck & Co.'s meters, was 1,336,267 gallons.

The amount charged by the company for this supply was 154*l.*, or 38*l.* 10s. per annum,—something more than 2s. 3d. per 1,000 gallons, and more than *four times the price of gas.*

But if the contention of the New River Company that the supply was for *domestic purposes* was real and sincere, how is it that they did not exercise the powers they say their Act of Parliament conferred, and charge 3 per cent. on the annual value of the property, 12s. for each single water-closet, and 6s. for each additional water-closet, in which case they could have charged 61*l.* 11s. per annum, or 246*l.* 4s. for the four years alluded to,—a sum which would have been equivalent to 3s. 8d. per 1,000 gallons, or more than six times the price of gas?

I believe that the policy adopted by the New

River Company of charging so much less than they contend they are entitled to charge has deterred many consumers from taking action in the matter, lest their opposition might provoke reprisals; indeed, a director of one company holding a large amount of office property in the City stated that his company preferred to pay what they knew was an excessive and unfair rate, rather than join in litigation which might involve them in a heavier charge for water.

I think a fair deduction to be drawn is that the New River Company entertained grave doubts as to the righteousness of the charges they were making, knowing full well that the supply was not for the domestic purposes contemplated by the Act of Parliament. THOS. HORSEY.

No. 11, *Billiter-square, E.C.*

MYSTERIOUS TENDERS.

SIR,—We are not unaccustomed to see wide differences between the tenders for buildings which comprise many trades; but when we see a difference of 124*l.* and 45*l.* between the highest and lowest tender for a lift for the new parish offices, Birmingham, the mystery calls for explanation.

Possibly the architect may have left the competitors to recommend what each would consider best for the purpose, for each tender cannot possibly represent the same type or quality of work. Even had he gone so far as, for instance, to specify "a lift to raise 5 cwt. by hydraulic power," it might cost anything from 120*l.* to 500*l.*, and full value might be given for any price between these limits.

In arranging engineering contracts, whether for machinery, systems of heating, ventilating, lighting, cooking, lifting, &c., the only way to compare prices is to know beforehand exactly what one wants; otherwise the result is a set of tenders which may be damaging to an engineer who has estimated for better work than is required; and may get unfairly quoted as an "expensive man." ARCHITECT.

SALFORD SEWAGE WORKS.

SIR,—I am always loth that my name should appear in print in relation to matters of a personal nature, first, because I hold advertising to be unprofessional and obtrusive; and, secondly, because matters of a private character cannot be of the least interest to the public. I am not disposed to enter into any controversy as to the authorship of the Salford Sewage Works. Two separate and almost distinct schemes were prepared for the outfall works; for when the first project came to be critically examined, it was found that certain changes were imperatively necessary.

1. The tanks and head-works were extensively altered in dimensions and design.
2. For a 40-h.p. engine to drive the mixing machinery, turbines, to be worked by the effluent water, were substituted, which, of course, effects a large saving in fuel and labour.
3. The tanks, instead of being situated in low ground, were placed at such a height as to command certain land which adjoins them, as a necessary precaution in case filtration should be found necessary in addition to precipitation.
4. Instead of centrifugal-pumps, slow-motion engines and pumps were erected, as being better suited for continuous working; and
5. A variety of other radical changes were made which altered the entire character of the works.

If, by any possibility, this matter should be of general interest,—which I very much doubt,—I shall be happy to allow an inspection of the whole of the drawings,—for the original as well as of the revised schemes. The plans will speak for themselves.

I shall not trouble you further on this matter.

ARTHUR JACOB.

Town-hall, Salford, Jan. 16th, 1884.

Rendle's Patent Glazing.—We have received a description, accompanied by a sectional drawing, of a new system of glazing for roofs, patented by Messrs. Edgcumbe Rendle & Co., and called the "Invincible," as being impervious to the attacks of rain. It appears likely to answer to its name. The edges of the glass are securely clipped between a capping above and a hollow bar beneath, forming a water channel, the capping being held tight against the upper surface of the glass by a screw bolt and nut, the bolt passing between the edges of the contiguous squares of glass and connecting the capping and the bar. Should any water be driven through between the capping and the glass, it drops between the edges of the glass into the hollow bar, which acts as a small gutter, and carries it off. The lower edge of the bar has an attachment to form a channel for condensation drip on the usual principle. The thing seems very complete and efficient, and the screw-bolt and nut allow of the capping being easily tightened on the glass whenever it becomes necessary.

COMPETITIONS.

Board Schools, Northampton.—After two days' examination and consideration of the eighty-one sets of plans sent in for the proposed new Board schools in Military-road, the referee, Prof. T. Roger Smith, selected two bearing the mottos "N" and "Plan," both of which turned out to be by Messrs. W. Talbot Brown & Charles Dorman, joint architects, Wellingborough and London. Of the whole number of designs, twenty-one bearing the following mottos obtained five-sixths of the full number of marks:—"Whiston," "Perseverantia," "N," "Christmas," "Croquis," "Lux" (*a*), "Plan," "Straightforward," "Labor omnia vincit," "Nothing like Leather," "52," "Experientia," "Simplex," "Practical Utility," "Knowledge is Power," "Measure for Measure," "Light, Air, and Economy," "Advancement," "Ipsissima," "Late," and "Study." The final selection was between "Light, Air, and Economy," "Straightforward," "Lux" (*a*), "Measure for measure," "Plan," and "N," the two latter being ultimately chosen, of which "N" has been decided upon by the members of the Board. In the design marked "N," the main front faces the street, with the boys' entrance at the north-west corner, and the doors for girls and infants at the opposite end. In the boys' department four class-rooms are provided, and a room sufficiently large to accommodate two classes, a sliding glass partition being arranged in the centre for the purpose of dividing the classes. The divisions between the large room and the class-rooms are proposed to be partly glazed, by which means the headmaster would be enabled to overlook the whole of the class-rooms when at his desk. The girls' department is provided with three class-rooms only, but in other respects the arrangements are exactly the same as in the boys' divisions. In the infants' department four class-rooms, a babies' room, and a large apartment, are provided. Every room has windows on two sides, and some on three, while ventilation is provided for by means of upright shafts, sashes made to open, openings in the centre of the ceilings, and Boyle's ventilators placed in the turrets. Steam is suggested for heating purposes. The walls are proposed to be of local bricks, with Bath stone dressings to doors and windows. The roofs to be covered with green slates and red ridge tiles, the whole of the rooms to have boarded dados, the floors to be covered with wood blocks, and the playgrounds to be asphalted. The estimated cost is 8,700*l.*

Hanley.—The Presbyterians of Hanley are about to pull down their present place of worship and rebuild it, in consequence of a fire having partly destroyed the interior of the building some short time back. Architects have been invited to send in designs for the new building, and at a meeting of the committee on Monday last they chose the design sent in by Mr. G. W. Bradford, and appointed him their architect for the new building. The new church will be of a plain Gothic character, and will consist of nave, with aisles at each side, tower at the west end, two transepts, ministers' and deacons' vestry, and gallery at one end, accommodation being provided for 500 persons.

PROVINCIAL NEWS.

Bootle.—On Monday last Beaconsfield Hall and other premises intended to serve as a Conservative Club House, in Pembroke-road, Bootle, were opened by Sir R. A. Cross. The premises are approached from Pembroke-road by two entrances, admitting into two entrance-halls. That to the right will be used for the stage, hall, and committee-rooms, and also for special entrance when the club is in occupation. The entrance on the left is for the use of the club proper, and also for the hall above. On the ground floor there is a large reading-room, dining-room, and billiard-room. There are also ante-rooms, lavatories, &c. In the rear of the building is a kitchen, with scullery, larders, &c. There is a staircase to the basement floor from the entrance hall, and on this floor are provided rooms for the Conservative Working Men's Association, with spacious cloak-room, lavatories, &c.; also billiard-room for two tables, and dining-room, capable of accommodating 200 persons. On the mezzanine floor are provided retiring-rooms, lavatories, &c. On the first floor there is an entrance through swing doors to a large assembly room 90 ft. 6 in. by 40 ft., and 30 ft. high. This hall is capable of seating about 930 persons, and has a large stage provided at the south end. At the opposite end is provided a gallery along the full width of the building, capable of seating 290 adults. The ceiling of the hall is eliptical in form, and the acoustic qualities are said to approach perfection. There is provided under the gallery a large crush-room and ladies' retiring-room. With regard to the question of ventilation, which has been well considered, the extractor in the roof has been provided by Messrs. Kershaw, of Lancaster. The main outlet is 38 in. in diameter, and is connected by a channel to open ornamental gratings in ceiling. The principal facade towards Pembroke-road is designed in the Jacobean style of architecture, with an admixture of German Renaissance. It is faced with Edwards's "pressed bricks" from Ruabon kilns, and red stone dressings. The roof is steep pitched, and covered with Nendhelliton slates, with lead hips, terminals, &c. The building has been erected by Messrs. Bell & Burnie, contractors, Keble-road, Bootle. The heating apparatus was supplied by Mr. I. A. Buck; the ventilation and all other matters have been superintended by the architect. The furnishing is being carried out by Messrs. Rumney & Love, Bold-street. The building has been designed and erected under the superintendence of Mr. Thomas Cox, of Cook-street, Liverpool.

Abergavenny.—The extension of the Joint Counties Asylum, Abergavenny, has now been completed. The contract with Messrs. Horsman & Co. to carry out the buildings was 42,000*l.* The laundry is a spacious building, having a general washhouse, 80 ft. by 25 ft., well lighted and ventilated, and fitted up with rinsing and soaking tanks, steam boiling-coppers, a large-sized hydro extractor, and a Bradford's washing-machine; in close connexion with these are two sets of drying-horses, containing twenty in each, heated by steam coils, the waste heat being utilised in a room formed over these for the purpose of drying beds, &c. There is also a smaller washhouse for foul linen. The machinery is driven by a Tangye Bros.' 10-h-p. double standard vertical engine, connected to horizontal shafting fixed in a brick-built subway running along under the floor of the washhouses. Under the laundry washhouse is a tank, built to contain 120,000 gallons, which receives the rain-water from most of the buildings around. The whole of this machinery has been supplied and fixed by Messrs. J. & F. May, engineers, of High Holborn. The boiler-house contains three single-tube Lancashire boilers, 18 ft. long and 6 ft. diameter, with Galloway tubes. The dining-hall is 107 ft. long, 50 ft. wide, and 24 ft. to the roof-plate. The hall is lighted by a spacious lantern, with sashes all round, some of which are hung on centres, and opened and closed by connecting rods and screw gearing, 6 ft. above the floor. The hall is lighted at night by two star lights of sixty burners each, and fourteen brackets of three burners to each. All the woodwork is executed in pitch-pine, and varnished. There are no fewer than eleven entrances to the room, six of which have wide double doors. Upstairs, the room which was formerly used as a chapel has been altered into two rooms, namely, the board-room and the committee-room. The kitchen, which is conveniently near the dining-hall, is a commodious apartment, fitted up with the latest and most approved cooking apparatus. The steward's room, containing the stores, is a large room, with a gallery and side shelves for stores. The steward's office is divided from the rest of the room by a glazed division, the clerk's office being similarly formed on the other side of the room. From this room a door opens into the baker's bread-room. A door from this room opens into the bakehouse itself. The ovens are capable of holding 200 four-pound loaves at one batch. The lavatories and water-closets have all the fittings of modern and approved descriptions. The chapel is built of Gilwern stone, with Bath stone dressings. All the woodwork is executed in pitch-pine, and varnished. There are 550 sittings, the aisles, chancel, and communion being executed in encaustic tile paving. The building is heated by hot air from a chamber under the vestry. The architects were Messrs. John Giles & Gough, of 28, Craven-street, Charing-cross; and Mr. Thomas Gamage, of Holloway, London, has been the clerk of works, and has rendered valuable assistance in carrying out the minor details and requirements of the medical staff. The contractors were Messrs.

P. Horsman & Co., of Wolverhampton, Mr. A. Smith being their foreman of works. The whole of the locks have been made *en suite*, with master-keys to pass, similar locks being fitted to the existing doors in the old wards, and were supplied by Messrs. Hobbs, Hart, & Co., of Cheapside, London. The ovens in the bakery were built by Messrs. Smith & Son, of York-road, Lambeth.

Books.

Practical Geometry and Engineering Drawing. By GEORGE SYDENHAM CLARK, Captain Royal Engineers. Second edition. London: Spon.

THIS work appears to comprise the course of drawing practiced at Cooper's Hill Schools. It is of an elementary character, carrying the student little beyond the orthography of the art. It is accompanied by some good advice in the selection of the best materials and tools necessary to the art, which will be found useful to the beginner. The art of drawing bears much the same relation to the duties of an advanced draughtsman that penmanship does to the literary man, giving to him merely the power to convey his ideas to others. An author may be very accomplished, though it puzzles the printer to decipher his writing. So it is better to produce a rough sketch of good architectural design, or good engineering work, than an elaborate drawing bad in design, or representing faulty construction. In this respect architectural and engineering drawing differs entirely from the work of the artist. The painting finished, the artist's work is done. The engineer's drawing is but preliminary to the commencement of the work.

Perhaps the most useful application of accurate drawing is to the solution of mechanical problems, which, from their irregularity and complexity, defy any other process; that shows how proper clearance is to be attained in machinery in motion, and determines the strains on structural forms. Not that slovenly drawing is ever desirable, but that beauty in a drawing should always be sacrificed to utility, except where beauty is the end to be attained, as in architectural elevations, &c. The author claims that care has been bestowed on the plates, that they may be, as far as possible, examples of drawing, and justly remarks that, by a strange irony illustrations to works of the kind are too often more fitted to serve as warnings than as guides to the student.

The illustrations have certainly not escaped the usual irony, at least as far as the curves are concerned. Most of the ellipses may serve as warnings to the student. Out of some twenty or more illustrated there are only two or three which would pass muster if examined by an experienced draughtsman. They appear to have been built up of circular arcs, and the positions of the centre often badly chosen. The usual too familiar result has necessarily followed. Where, however, the figures are formed of straight lines they are very good, and the perspective illustration is excellent. The examples of sciography are of a very elementary description, and will afford little assistance to the architectural draughtsman in the complex cases which he continually encounters.

As a text-book this work will be found useful to the young beginner, more especially the chapter on Perspective, and the generally good advice given for the selection of instruments, and for the manipulation of materials. The plates in this edition are bound separately, a form more convenient for reference while reading the text, but rather inconvenient for the library when bound in volumes differing so much in size. The class questions and examples are numerous and well selected, and will afford good practice to the more advanced student.

Wood Block Flooring.—We hear good reports of the improved wood-block flooring patented by Mr. Lowe, of the Cement and Wood Pavement Works, Farnworth. The wood blocks, long and narrow, are laid in a patent preservative composition, on a floor composed of a system of iron beams and cross joists combined with cement concrete. A correspondent states that in his warehouse heavy goods have been trucked over a space (5 ft. wide) of this flooring for two years and a half without the displacement or damage of a single block.

MEETINGS.

SATURDAY, JAN. 19.

Artisans' Technical Association (1, Adam-street, Adelphi).—Paper by Mr. A. Harland, A.R.I.B.A. 8 p.m.

MONDAY, JAN. 21.

Royal Institute of British Architects.—Col. the Hon. A. Parnell (late R.E.), on "The Action of Lightning Strokes in regard to the Metals and Chimneys of Buildings." 8 p.m.

Royal Academy.—Mr. J. E. Hodgson, R.A., on "Art as influenced by Michelangelo." 8 p.m.

London Institution.—Mr. H. H. Statham, on "Ornament." 5 p.m.

TUESDAY, JAN. 22.

Surveyors' Institution.—Students' Preliminary Examination.

Institution of Civil Engineers.—Mr. William Hackney, B.Sc., Assoc.-M. Inst. C.E., on "The Adoption of Standard Forms of Test Pieces for Bars and Plates." 8 p.m.

Royal Institution.—Mr. Reginald Stuart Poole on "The Study of Coins and Medals." 3 p.m.

WEDNESDAY, JAN. 23.

Surveyors' Institution.—Students' Preliminary Examination (continued).

Society of Arts.—Mr. William Lant Carpenter, B.A., on "Science Teaching in Elementary Schools" (Sir John Lubbock in the chair). 8 p.m.

THURSDAY, JAN. 24.

West London School of Art.—Presentation of Prizes, and Address by Mr. J. Comyns Carr. 8 p.m.

Society of Antiquaries.—(1) Major Cooper, F.S.A., "On a Saxon Interment in Toddington Parish, Beds"; (2) Mr. Aug. W. Franks, F.R.S., and Mr. C. S. Percival, LL.D., "On a Collection of Italian Seal-boxes and Matrices of Seals exhibited by permission of the Duke of Buccleuch." 8 p.m.

Society of Arts (Applied Chemistry and Physics Section).—Professor Wanklyn on "The Manufacture of Gas from Limed Coal." 8 p.m.

London Institution.—Mr. W. A. Barrett on "Mozart's Operatic Works." 7 p.m.

FRIDAY, JAN. 25.

University College.—Professor C. T. Newton on "Lycian Rock Tombs." 4 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. James Johnstone Bourne on "The Expenditure of Power in Steamship Propulsion." 7 p.m.

SATURDAY, JAN. 26.

Architectural Association.—Visit to the New Council Chamber, Guildhall, and new offices in Lime-street. Assemble in Guildhall at 3 p.m.

Miscellanea.

Electrical Engineering.—The second of a course of lectures on "Electrical Engineering," by Mr. Jno. C. Fell, M.I.M.E., &c., was delivered on the evening of January 14 in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. T. Hovenden, member of the council, in the chair. The lecturer commenced with an explanation of the generation of a galvanic electrical current from chemical reaction, explaining clearly the chemical changes taking place in the cell. The lecturer then gave a very useful list of the chief commercial galvanic batteries at present in use, with details of the various positive and negative elements. An explanation of the formula $Q = \frac{E}{R}$ followed with its various adaptations to alternative combinations of batteries in partial series and partial parallel arc. The comparison between single and double celled batteries was fully gone into, and the effect of the double cell on increased internal resistance was clearly explained. The practical adaptation of batteries to electrolysis, electro-plating, or lighting purposes was fully discussed, and the lecture terminated with some new theoretical views expounded by the lecturer upon the value of dispensing as far as possible with internal fluid resistance.

City of London College.—Of the thirty-four students from the City of London College, who sat for the Building Construction examination of the Science and Art Department in May last, not one failed. Two passed in honours, thirteen in the advanced stage, and nineteen in the elementary stage; there were eleven first-class certificates. The only failures in ten years have been eight honours, one advanced, and six elementary, out of 211 students examined; or an average success in all stages of ninety-three per cent., whereas the general average of the kingdom is under sixty per cent.

The Weather and the Public Health in 1883.—In view of the satisfactory condition of the public health in 1883, judged by the national death-rate, which, so far as is at present known, did not exceed the low rate of 19·5 per 1,000, it is interesting to consider one or two of the principal meteorological features of the year derived from daily observations at the Royal Observatory, Greenwich. The mean temperature of the year was 49·3°, against 48·9° and 49·7° in 1881 and 1882, and was 0·8° above the average mean in 100 years. Compared with the same mean standard, February was exceptionally mild, and March as exceptionally bleak and cold. The mean temperature of August showed an excess. With these exceptions the monthly mean temperature differed but slightly from the averages. The only marked effects produced by the temperature was a considerable temporary increase of mortality due to the cold March, which more than balanced the favourable effect of the mild February; and a sudden increase of infantile diarrhœa fatality, due to the excess of temperature in August. The temperature of each of the last four months of the year being slightly above the respective average, undoubtedly conduced to the low mortality of the last quarter of the year. Rain was measured at Greenwich, on 173 days in 1883, to the aggregate amount of 21·9 in., showing a deficiency of 3·4 in., compared with the average amount in sixty-one years. The deficiency of rainfall was most marked in March, August, and December; whereas the months showing the largest excess were February and September. The amount of bright sunshine recorded in the year was 1,241 hours, differing but slightly from the amount in each of the five preceding years, excepting only 1879, when the amount fell to 983 hours. The sunshine exceeded the average in August, but showed a marked deficiency in December. The weather in 1883 was, on the whole, fairly favourable to health, being free from severe frost in winter and from excessive summer heat. It is, however, mainly to other causes that we must look for an explanation of the low death-rate of the year.—*The Lancet.*

New Altar and Reredos, Great Grimsby. A new altar has just been erected by the Hon. Mrs. Fraser, in the Chantry Chapel of the Sacred Heart, in the R.C. Church of St. Mary, Great Grimsby. In the centre of the reredos is a statue of Our Lord, in a niche with octagonal canopy, a perforated tracery spire, with crocketed gables, pinnacles, finials, and supported on either side by statues of St. Mary Magdalen and St. John the Beloved, in their niches, standing on a richly-carved projecting bracket and canopies, supported by marble shafts, and finished by an elaborate carved and perforated cresting. The altar front is deeply recessed, having three moulded panels; the centre one contains a carved monogram of the Sacred Heart, with a crown of thorns and rays of light, and on each side are sculptured angels in adoration. Above the altar is the Tabernacle, terminating with a crocketed gable richly carved and supported on marble columns. On each side is a marble super-altar, behind which are richly-moulded panels with inlaid marbles. The centre portion of the architects' design only is now erected, but when complete the reredos will be continued on each side of the chapel. The whole is from the designs of Messrs. Pugin & Pugin, of London and Ramsgate, and executed by Messrs. Boulton & Sons, the well-known architectural sculptors, of Cheltenham.

Lectures on Architecture and Sculpture at the Royal Academy.—The following courses of lectures to the students of the Academy have been arranged for: *Architecture:* Feb. 7 and 14, "Ancient Egyptian Architecture," by Mr. R. Stuart Poole; Feb. 18, "Colour applied inside Buildings: Marble and Mosaic," and Feb. 25, "Stained Glass and Painting," by Mr. George Aitchison, A.R.A. *Sculpture:* Feb. 21, "On the Monuments of Ancient Art which have been discovered between the time of Winckelman and 1850," by Mr. C. T. Newton, C.B.; Feb. 28, "On the Monuments of Ancient Art which have been discovered since 1850," also by Mr. Newton. Mr. Poynter, R.A., will lecture on "Sculpture" on March 3 and March 10.

Technical Schools at Nottingham.—The Technical Schools in carpentry, lace-making, &c., in connexion with the University College, Nottingham, will be formally opened by Sir Frederick Bramwell on the 24th inst.

Celtic and Roman Britain.—An interesting lecture on this subject was delivered on January 10, before a crowded theatre at the London Institution by Mr. Alfred Tylor, F.G.S. It was illustrated by numerous drawings of remarkable antiquities. Some of them bore Eastern symbols, others were purely Roman in character, others again of British origin. Besides a number from Lydney, they mostly belonged to the Roman remains beneath Warwick-square, explored by the lecturer himself, or to the magnificent Roman villa with its appendages which have been so thoroughly excavated during the last years near Brading by the Messrs. Price. It was pointed out that these Roman remains illustrate the little-known rites of the Persian Sun-god Mithra, whose mysteries were introduced into Italy about the beginning of the Christian era. Mr. Tylor's lecture on this subject at the Royal Institution will be remembered by those who heard it. Mr. Tylor had prepared a map of all the Roman roads which are still in use as great trade highways at the present time, and he pointed out how large a number of them converged at Winchester (Venta Belgarum), which was evidently used as a general *entrepôt* for conveying the metallurgical products of Britain to the Continent. So many British sepulchral mounds were to be found on some of these routes that they must have been chariot or horse routes centuries before the Roman occupation of our island. Then from Winchester the tin, iron, and lead from Cornwall and Wales could be carried to Beaulieu, thence eight miles to Stans-ore Point,—a name etymologically connected with the word *stannum*, tin,—to the shores of the Solent. This point was but a couple of miles from Gurnard's Bay, in the Isle of Wight, whence there was an easy road to Brading, a very safe port. The lecturer went on to refer to the Celtic invention of the well-known Ogham characters,—an achievement which he thought correspondent with the high metallurgical and artistic skill shown in ancient Celtic jewellery.

Train Lighting by Direct Electricity.—In the few examples of railway-carriage lighting by electricity which have hitherto come under our notice, batteries, either secondary or primary, have formed the sources of the illuminating power. Recently, however, an experiment in train lighting by direct electricity has been successfully made, and is being continued on the Metropolitan District Railway in connexion with one of the suburban trains running from High-street, Kensington, to Putney. In carrying this out, a Siemens dynamo and a Williams three-cylinder engine are placed in a luggage-van which is attached to the train. In the van is also a small boiler from which steam is supplied to the engine. The carriages are lighted by means of a total of twenty-eight Swan incandescence lamps of twenty candle-power each, which give a very brilliant light. The present machinery was designed for a longer train, and, in addition to the lamps in the carriages, there are about thirty in the van, which are always lighted when the others are. The object of this is to ascertain the exact cost of working a sufficient number of lights for the longer trains, which are usually fitted with fifty ordinary gas-lamps. The results of the trial of the light so far are considered very satisfactory.

Bispham.—The unveiling of the stained-glass window presented to the new church at Bispham, near Blackpool, by the Freemasons of the Fylde, will take place on the 29th inst. The ceremony will be performed by Bro. the Earl of Lathom, D.G.M., and Prov. G.M. of West Lancashire. The subject of the centre compartment of the window is "The Good Samaritan," with the text, "Go thou and do likewise," on a rich ornamental base. In the opening on the left is Abraham's intended sacrifice of Isaac, with the text, "Lay not thy hand upon the lad"; and the right opening is filled with King Solomon kneeling before the altar, and dedicating the temple to the worship of Jehovah, with the legend, "Hearken Thou to the supplication of Thy servant." These subjects are all surmounted by rich foliated canopies on a ruby ground, and at the bottom of the window is an inscription recording the gift of the window, which has been executed by Messrs. Ward & Hughes, Frith-street, Soho-square.

St. Mary's Church, Far Cotton.—A contract has been entered into for the erection of a permanent building for 3,340*l*. The architect is Mr. Holding, of Northampton.

The Wilberforce Statue at Hull.—The Townhall of Hull has just received an addition to its collection of marble statues of the town's departed worthies, in the gift to the Corporation, by Mr. Henry Briggs, ex-Sheriff, of a heroic figure of William Wilberforce, the Emancipator. The statue is the work of W. Day Keyworth, jun. The likeness shows Wilberforce in advanced years. The statue was unveiled on Tuesday last by the Bishop of Newcastle.

Denmead.—The first of a series of contemplated windows has just been erected in All Saints' Church, Denmead, Hants. It consists of two lights, representing the "Walk to Emmaus" and the "Ascension." The artists are Messrs. Mayer & Co., who have prepared designs for all the windows in the church.

TENDERS.

For rebuilding the Freemasons' Hall, Great Queen-street. Mr. Horace Jones, architect. Quantities by Messrs. Reddall & Son:—

Holland & Hannen	£5,563 0 0
Perry & Co.	5,380 0 0
Axford	5,200 0 0
Lascelles	5,160 0 0
Chappell	5,120 0 0
Colls & Sons	5,091 0 0
Nightingale	4,881 0 0
Boyce	4,680 0 0
Conder	4,5 9 0 0
Macey & Sons*	4,313 0 0

* We are informed that this tender, with two others, was rejected in consequence of alteration in form of tender.

Tenders for sewering, levelling, kerbing, metalling, and making good two of the streets within the Finchley district for the Finchley Local Board. Mr. George W. Brumell, Surveyor:—

	Brownlow Road.	Groneisen Road.
H. J. Shepherd	£628 7 0 ...	£428 7 0!
McKenzie Williams & Co...	444 0 0 ...	414 0 0
P. G. Pound	427 0 0 ...	427 0 0
J. Pizzey	395 0 0 ...	400 0 0
Nowell & Robson	387 0 0 ...	387 0 0
G. Bell	376 0 0 ...	376 0 0
T. Adams	359 0 0 ...	369 0 0
J. Botterill	353 0 0 ...	353 0 0
J. Schofield	315 17 2 ...	315 17 2
Wm. Lloyd,* Kilburn Park	299 15 0 ...	299 15 0!

* Accepted.

For new warehouses, Nos. 10 & 11, Little Trinity-lane, London. Mr. H. H. Collins, architect, 61, Old Broad-street:—

Ockenden	£2,593 0 0
Boyce	2,283 0 0
Ashby & Horner	2,257 0 0
Morter	2,254 0 0
Colls	2,219 0 0
Downs	2,189 0 0
Shepherd	2,177 0 0
Roberts	2,173 12 0
Greenwood	2,129 0 0
Croaker	2,024 0 0

For alterations and additions to the Norwich Medical Institute. Mr. A. F. Scott, architect, Norwich. Quantities supplied:—

T. C. R. King	£493 0 0
W. Jermyn	457 0 0
W. E. Bailey	397 0 0
R. W. Dawes	397 0 0
W. North	395 0 0
R. W. Bennett	393 0 0
S. Bloy & Co.	392 10 0
J. Barnard	384 0 0
J. Hurn	376 0 0
J. W. Lacey	370 0 0
S. Chapman	360 0 0
T. W. Rutland	356 0 0
J. Young & Son	349 0 0
N. Hunn	340 0 0
G. Hammond	310 0 0
E. C. Cocks (accepted)	303 14 0

For rebuilding draper's shop, for Mr. W. Ilott (lately destroyed by fire), Bridewell-alley, Norwich. Mr. A. F. Scott, architect. Quantities supplied:—

J. Hurn	£683 10 0
R. Wegg	686 0 0
T. W. Rutland	650 0 0
H. Lacey	650 0 0
S. Bloy & Co.	621 0 0
J. Young & Sons (accepted)	595 0 0

For additions and alterations to No. 10, Trinity-square, Tower Hill, E.C. Mr. Jason Cutler, surveyor:—

Homer & Co., Holborn (accepted)	£960 0 0

(No competition.)

For the construction of stoneware and iron pipe sewer in Marsh Gate-lane, and the Pudding Mill river, Stratford, for the West Ham Local Board. Mr. Lewis Angell, engineer. Quantities by Messrs. R. L. Curtis & Son:—

Munday & Son	£3,989 0 0
Bottoms	2,649 0 0
Jackson, John	2,625 0 0
Botterill, J. W.	2,568 0 0
Wise & Wilson	2,550 0 0
Adams	2,450 0 0
J. W. & J. Neave	2,373 0 0
Standen	2,350 0 0
J. Bell (accepted)	2,295 0 0
Burling & Co.	2,157 0 0

For the erection of a villa residence in Burleigh Park-road, Addlestone, for Mr. Thomas Weeding Weeding, J.P. Mr. Charles Welch, Chertsey, architect and surveyor:—

James Harris	£1,900 0 0
James Martin	1,713 0 0
Richard J. Hunt (accepted)	1,659 0 0

For the erection of a school in Brecknock-road, Camden Town, for the London School Board. Mr. E. R. Robson, architect:—

Turtle & Appleton	£4,265 0 0
Goodman	3,773 0 0
Roberts	3,767 0 0
Reading	3,739 0 0
Williams	3,570 0 0
Stimpson	3,563 0 0
Smith	5,545 0 0
Scrivener	3,523 0 0
Shurmur	3,492 0 0
Bangs	3,392 0 0
Atherton & Latta	3,299 0 0
Patman	3,285 0 0
Brass	3,270 0 0
C. Wall	3,250 0 0
Jerrard	3,210 0 0
Wall Bros.	3,195 0 0

For the erection of schools in the Malmesbury-road, Old Ford, for the London School Board. Mr. E. R. Robson, architect:—

Johnson	£13,651 0 0
Goodman	13,422 0 0
Pritchard	12,725 0 0
Kirk & Randall	12,724 0 0
Hook & Co.	12,677 0 0
Gentry	12,630 0 0
Patman	12,588 0 0
Smith	12,515 0 0
Wood	12,496 0 0
Bangs	12,475 0 0
Lawrence	12,417 0 0
Grover	12,325 0 0
Stimpson	12,254 0 0
Oldrey	12,230 0 0
Boyce	12,216 0 0
Brass	12,200 0 0
Wall Bros.	12,186 0 0
C. Wall	12,168 0 0
Cox	12,144 0 0
Atherton & Latta	12,100 0 0
Shurmur	11,989 0 0
Jerrard	11,944 0 0
Perry & Co.	11,866 0 0

For the erection of a school in the Smeed-road, Old Ford, for the London School Board. Mr. E. R. Robson, architect:—

Johnson	£15,639 0 0
Wood	15,303 0 0
Boyce	15,180 0 0
Pritchard	15,165 0 0
Kirk & Randall	15,093 0 0
Gentry	14,981 0 0
Goodman	14,900 0 0
Patman	14,642 0 0
Lawrence	14,586 0 0
Grover	14,487 0 0
Bangs	14,310 0 0
Hook & Co.	14,296 0 0
Oldrey	14,231 0 0
Brass	14,214 0 0
Smith	14,179 0 0
C. Wall	14,118 0 0
Scrivener	14,113 0 0
Jerrard	14,093 0 0
Cox	14,080 0 0
Atherton & Latta	14,000 0 0
Shurmur	13,986 0 0
Wall Bros.	13 930 0 0
Perry & Co.	13,845 0 0

For building new schools at Grange-road, in the Southwark Division, for the School Board for London. Mr. E. R. Robson, architect. Quantities by Mr. T. Thornton Green:—

Appleton	£12,573 0 0
Johnson	11,542 0 0
Lathey Bros.	11,243 0 0
Marsland	11,220 0 0
Downs	11,180 0 0
Shepherd	11,111 0 0
Lawrance	10,936 0 0
Bangs	10,910 0 0
Tongue	10,9 5 0 0
Hook	10,854 0 0
Perry	10,838 0 0
Patman	10,833 0 0
Grover	10,829 0 0
Cox	10,800 0 0
Brass	10,800 0 0
Atherton & Latta	10,789 0 0
Wall	10,759 0 0
Smith	10,755 0 0
Hart	10,6 9 0 0
Stimpson	10,559 0 0
Wall Bros.	10,521 0 0
Kirk & Randall	10,459 0 0
Jerrard	10,439 0 0
Oldrey	10,395 0 0

For the first portion of new schools at West Silvertown, for the West Ham School Board. Mr. J. T. Newman, architect, 2, Fen-court, Fenchurch-street, E.C. Quantities by Messrs. Curtis & Sons:—

Holland	£5,485 0 0
Priestley & Gurney	5,052 0 0
Lake & Co.	4,990 0 0
J. Brickell	4,978 0 0
North Bros.	4,915 0 0
C. H. Hunt	4,846 0 0
B. E. Nightingale	4,844 0 0
C. Cox	4,799 0 0
Hearle & Son	4,793 0 0
J. Catley	4,774 0 0
G. J. Hoskings	4,767 0 0
A. Reed	4,753 0 0
W. Shurmur	4,581 0 0
Parfett	4,566 0 0
Howell & Son	4,390 0 0
Magee & Co.	4,207 0 0
W. Gregar	4,066 0 0

For the erection of two villas in Burwood Park-road, Walton-on-Thames. Mr. Charles Welch, architect and surveyor:—

S. Woods	£1,129 0 0
F. Peters	1,120 0 0
R. J. Hunt	998 0 0
J. Farley	983 0 0
J. Martin (accepted)	982 0

For the construction of a new sewer for the drainage of South Eltham, for the Metropolitan Board of Works. Sir J. Bazalgette, engineer:—

Bottoms Bros.	£39,970	0	0!
Pearson	34,890	0	0
Beadel Bros.	33,174	0	0
Nowell & Robson	32,750	0	0
Neave	32,500	0	0
Williams & Wallington	31,200	0	0
Killingback	29,500	0	0
Ford & Everett	29,500	0	0
Webster	28,300	0	0
Hill Bros.	27,422	5	9
Mowlem & Co.	26,348	0	0
Kellett	23,500	0	0
G. Stevenson*	19,995	0	0!

* Accepted, subject to inquiries.

For the erection of an infants' school, Crockett's-lane, Smethwick, for the Harborne School Board. Messrs. J. P. Sharp & Co., architects, 46, Cherry-street, Birmingham:—

G. H. Marshall	£3,289	0	0
J. Garlick	3,200	0	0
Harley & Son	3,098	0	0
H. Smith & Son	3,055	0	0
Whitehouse & Jones	3,039	0	0
Jeffery & Son	3,000	0	0
Walton Bros. (accepted)	2,895	0	0

For "barrack" buildings (exclusive of seating and lighting), and allowing for old materials, for the Salvation Army, on the site of the Royal Oak, Park-street, Leamington. Mr. E. J. Sherwood, architect, 101, Queen Victoria-street, London. Quantities supplied:—

Garlick, Birmingham	£2,650	0	0
G. F. Smith, Milverton, Leamington	2,189	0	0
W. Robbins, Coten End, Warwick...	2,070	0	0
J. Inwood, Malvern (too late)	2,045	0	0
J. Fell, Leamington	2,012	0	0
W. Lessaman, Leamington	1,940	0	0
W. Griffin, Corpe Hills, Wimbourne	1,920	0	0
T. Bailey, Leamington	1,735	0	0
W. Gascoyne, Leamington	1,729	0	0

For the erection of engineering works, Bute Docks, Cardiff, for the Wallsend Slipway and Engineering Company (Limited). Quantities by Mr. S. Rooney, Cardiff:—

C. Shephard, Cardiff (accepted)	£7,200	0	0

For the erection of stables in George-street, Camberwell. Mr. James W. Irwin, architect:—

H. Burman & Sons, Kennington (accepted) £164

For making new roads and surface-water drains on the Beach Hill Park Estate, Hadley:—

Marriott, Tottenham	£6,439	0	0
Wilson, Walthamstow	6,262	0	0
Dunmore, Hornsey	6,080	0	0
Pizzey, Hornsey	5,856	0	0
Harris, Camberwell	5,320	0	0
Lloyd, Kilburn	4,798	0	0

For drainage works, Great Yarmouth. Contract "D." Mr. J. Wm. Cockrill, Borough Surveyor:—

Cook, Bennett, & Thew, Spalding	£2,499	0	0
Beadle Bros., Erith, Kent	2,470	0	0
Neave, London	2,466	0	0
Want, Yarmouth	2,309	10	0
T. Cosham, Newark	2,250	0	0
R. Nudd, Yarmouth	2,227	9	6
Downing, Norwich	2,100	0	0
Botterill, London	2,089	0	0
Harbert, Yarmouth	1,932	0	0
W. Wood, Chelmsford	1,870	0	0
Cork & Beech, Yarmouth	1,810	0	0
Cowdery, Newent, Gloucestershire	1,788	0	0
Bennett, Ipswich	1,730	0	0
Gibson, Exeter	1,710	0	0
J. Hayward, Eastbourne (accepted)	1,655	0	0
R. Nicholson, Brentwood	1,560	10	6¾

[Surveyor's estimate, £1,950.]

For erecting roof over purifiers at the Sevenoaks Gas Works. Mr. A. Penny, engineer:—

				Extra for wood columns.		
Punnett	£496	0	0	£35	6	0
Constable	490	0	0	25	0	0
Wiltshire	460	0	0	28	0	0
Durtnell	359	0	0	27	0	0

For erecting eight villa-residences at Birchington Bay Estate, Kent, for the Birchington Bay Estate Company (Limited). Mr. E. C. Homer, architect, Mansion House Chambers:—

Waterman (accepted)	£2,700	0	0

For footpath improvements for the Beckenham Local Board. Mr. Geo. B. Carlton, Assoc.-Mem. Inst. C.E., engineer and surveyor:—

Alldred & Co., Hammersmith	£9,742	11	4
Wheeler & Hindle, Bankside	9,023	4	3
J. Gabriel, Lambeth	8,986	12	2
Ambrose & Son, Bath	8,483	2	3
The Victoria Stone Company, Kingsland-road	8,334	16	3
Hill Bros., High Wycombe	7,741	3	4
T. Free, High Wycombe	7,660	9	11
C. Hunt, High Wycombe	7,540	4	10
Woodham & Fry, Greenwich	7,330	2	2
A. Palmer, Birmingham	7,287	7	5
J. Mowlem & Co., Westminster	7,264	5	3
Kellett & Bentley, 4, Queen Victoria-street	6,948	1	0
E. & W. Iles, South Wimbledon	6,615	18	5
G. B. Marshall, Brighton	5,871	18	8

[Engineer and surveyor's estimate, 7,249*l.* 6s. 3d.]

For additions to the Waverley Hotel, Clacton-on-Sea. Mr. Charles Fell, architect, Dashwood House, New Broad-street. Quantities by Mr. H. Lovegrove, 26, Budge-row:—

Foster & Dicksee	£3,799	0	0
Porter	3,786	0	0
Saunders	3,730	0	0
Martin	3,667	0	0
Wood	3,490	0	0
Gillingham	3,445	0	0
Brown	3,398	0	0
Everett	3,349	0	0
Gibbons	3,300	0	0

TO CORRESPONDENTS.

T. B. (too late).—H. J. (received).—F. W. R. & Co. (cannot return to the subject).

Correspondents should address the Editor, and *not* the Publisher, except in cases of busines.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

PUBLISHER'S NOTICES.

THE INDEX and TITLE-PAGE for Volume XLV. (July to December, 1883) were given as a Supplement last week, and A COLOURED TITLE-PAGE is issued with this Number, in substitution for that published previously.

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RANDELL, SAUNDERS, & CO., Limited,
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[ADVT

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